# NATIONAL CAR BUILDER

VOLUME XV. NUMBER 6.

DEVOTED TO THE INTERESTS OF RAILWAY ROLLING STOCK.

$1.00 PER ANNUM SINGLE NUMBERS TEN CENTS.

NEW YORK: Morse Building, 140 Nassau St.

JUNE, 1884.

Entered at the Post Office at New York N. Y., as Mail Matter of the Second Class.

CHICAGO: 144 N. Clark Street.



Fine Coach and Railway Varnishes.

CLARENCE BROOKS & CO.

MANUFACTURERS OF VARNISHES,

Cor. West and West 12th Streets, NEW YORK.

SEND FOR PRICE LIST.

GEO. WESTINGHOUSE, Jr., President. T. W. WELSH, Superintendent. JOHN CALDWELL, Treasurer. W. W. CARD, Secretary. H. H. WESTINGHOUSE, General Agent.

THE WESTINGHOUSE AIR-BRAKE COMPANY,

Pittsburgh, Pa., U. S. A.,

MANUFACTURERS OF THE

WESTINGHOUSE AUTOMATIC BRAKE,
WESTINGHOUSE LOCOMOTIVE DRIVER BRAKE,
VACUUM BRAKES (Westinghouse & Smith Patents),
WESTINGHOUSE FREIGHT BRAKE.

The Automatic Freight Brake is essentially the same apparatus as the Automatic Brake for passenger cars, except that the various parts are one piece of mechanism, and is sold at a very low price. The saving in accident-, flat wheels, brakemen's wages and the increased speed possible with perfect safety, will repay the cost of its application within a very short time.

The "AUTOMATIC" has proved itself to be the most efficient train and safety brake known. Its application is instantaneous; it can be operated from any car in the train, if desired, and should the train separate, or a hose or pipe fail, it applies automatically. A GUARANTEE is given customers against loss from PATENT SUITS on the apparatus sold them.

FULL INFORMATION FURNISHED ON APPLICATION.

Warranted Superior to any Steel in the Market, either English or American, for every purpose. Send for Circular and Price List.

CHROME CAST STEEL

CHROME STEEL WORKS, Kent Av. & Keap St., Brooklyn, E.D., N.Y.

TIEMANN'S

PAINTS AND COLORS,

DRY, IN OIL AND IN JAPAN,

SPECIALLY PREPARED FOR

Car, Coach and Carriage Manufacturers.

85 Per Cent. IRON PAINT

For Iron Work and Roofing.

D. F. TIEMANN & CO.,

16 Murray St. and 19 Park Place, New York.

SELECT FURNITURE, Antique Designs. SPANISH AND VENETIAN LEATHERS. Charles R. Yandell & Co. INTERIOR DECORATIONS, Choice Curtain Materials. No. 6 East 15th Street, New York.

GEORGE WESTINGHOUSE, Jr., President. ROBERT PITCAIRN, Treasurer. ASAPH T. ROWAND, Secretary. C. H. JACKSON, Vice-Pres. & General Manager. HENRY SNYDER, General Agent.

THE UNION SWITCH AND SIGNAL CO.,

SOLE MANUFACTURERS OF APPROVED

RAILWAY INTERLOCKING, SWITCHING & SIGNALING APPLIANCES,

With Automatic Electric Locking, without which no interlocking is safe.

FROGS, CROSSINGS, SWITCHES AND SWITCH STANDS.

Catalogues, Plans and Estimates, with reference to about 500 apparatus in practical operation, will be furnished upon application.

OFFICE AND WORKS, corner Garrison Alley and Duquesne Way, PITTSBURGH, PA., U. S. A.

CLIFF & RIGHTER CO.

(Limited.)

CHAS. D'W. GIBSON, Pres. GEO. B. SLOAN, Treas. EDMUND K. RIGHTER, Sec. EDWARD CLIFF, Sup't.

MANUFACTURERS OF

RAILWAY

CAR SPRINGS.

OSWEGO, N. Y.,

AND

38 CORTLANDT STREET, NEW YORK CITY

IMPERIAL RAILWAY

VOSE

Graduated Springs

FOR

CITY, FREIGHT & PASSENGER CARS.

RICHARD VOSE,

13 Barclay St., NEW YORK.

IMPERIAL RAILWAY

GEORGE WESTINGHOUSE, JR., President. RALPH BAGALEY, Secretary and Treasurer. H. H. WESTINGHOUSE, Superintendent.

THE WESTINGHOUSE MACHINE COMPANY.

General Sales Offices: 92 and 94 Liberty St., New York.

Works: 24th and 25th St. and Liberty Ave., Pittsburgh, Pa.

Manufacturers of THE WESTINGHOUSE STEAM ENGINE, THE ALDEN CRUSHER AND PULVERIZER, DAMASCUS BRONZE.

THRESHER'S RAILWAY VARNISHES

Manufactured by Thresher & Co. Dayton, O.

Unsurpassed in Quality.

Established 1858

THE KING VARNISH CO.,

VARNISHES & JAPANS Correspondence Solicited. AKRON OHIO. VARNISHES & JAPANS

THE WHARTON RAILROAD SWITCH COMPANY, Philadelphia, Pa.,

Manufacturers of the HALL RAILWAY SIGNAL.

SOLE PROPRIETORS OF THE ONLY COMPLETE AND RELIABLE SYSTEM OF AUTOMATIC ELECTRIC RAILWAY SIGNALS, Comprising Visual and Audible Signals for Stations, Switches, Crossings, Draw-Bridges, Block Sections, etc., etc.

Special attention is called to our system of INTERLOCKING OF ELECTRIC SIGNALS for grade-crossings, junctions, etc., rendering COLLISIONS AT SUCH POINTS IMPOSSIBLE.

Full Information, with Plans and Estimates, Furnished on Application.

D. P. SLATTERY, President. JOHN B. GRAY, V. P. & Gen. Mg'r. E. B. LEIGH, Sec'y and Treas.

American BRAKE Company,

MANUFACTURERS OF

AUTOMATIC FREIGHT CAR BRAKES AND STEAM DRIVER AND TENDER BRAKES.

ST. LOUIS, MO.

S. W. McMUNN, Supt. ALBERT BLAIR, Attorney.

We offer to Railway Companies the only Exclusively Independent Self-Acting Freight Train Brake which has yet been adopted by any Railway in the World. Our Steam Driver and Tender Brake is acknowledged to be the Cheapest, Simplest and BEST Power Brake now in use. Is now used by over 100 different Railroads.

C. E. JAMES & CO.

RAILWAY, FURNACE AND MINING SUPPLIES.

CHATTANOOGA, TENN.

JAMES DOUGHERTY. Chicago Exhibition, June, 1883. 1 Gold Medal. 6 Silver Medals.

The Machine Tool Works, (Formerly FERRIS & MILES.) Twenty-fourth & Wood Streets, Philadelphia, Pa. First-class Machine Tools and Steam-hammers for R. R. Shops. (Satisfaction guaranteed.)

FREDERICK B. MILES. Cincinnati Exhibition, Sept., 1883. 1 Gold Medal. 7 Silver Medals.

GRANULATED CORK.

THE BEST ARTICLE IN USE FOR FILLING IN Refrigerator Cars, Ice Houses, Deadening Coach Bottoms, etc.

References furnished on application. Send for sample to

ARMSTRONG, BRO. & CO., PITTSBURGH, PA.

FOR CARS.

Cold drafts around car windows and doors, also Dust and Cinders entirely excluded, and Rattling sashes stopped by Browne's Metallic and Rubber Window and Door Bands, used 15 years on Drawing Room, Sleeping and Passenger Cars in U.S. and Europe — Wagner, Pullman and all R. R. Cos and Car Builders. Samples mailed free.

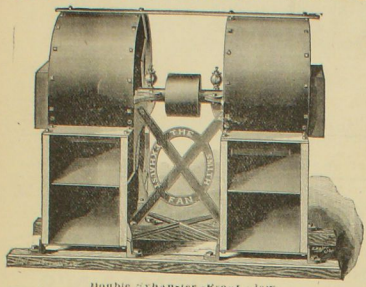
Pat. Metallic Weather Strip Co.

924 Broadway, N.Y.

# THE SMITH EXHAUST FAN AND FORGE AND PRESSURE BLOWER.

BEST AND CHEAPEST. SAVES 50 PER CENT. OF POWER.

HAS DOUBLE SUCTION AND DOUBLE DISCHARGE.



Double Exhauster—Front View.

WHAT BUYERS SAY:

PULLMAN PALACE CAR CO., St. Louis Division.—The Smith Exhaust Fan is giving perfect satisfaction. Has an exceedingly strong draft. Power to drive it hardly noticeable. E. A. BENSON, G. F. P. P. Car Co.

CHICAGO.—The No. 8 Fan you put into my mill is giving the best satisfaction of any I have ever used. GEO. W. STRAIGHT.

TONAWANDA, N. Y.—Your No. 8 Smith Exhaust Fan in our planing mill works to our entire satisfaction. GRATWICK, SMITH & FRYER LUMBER CO

CHICAGO.—Have found no other make of Fan that appears to so nearly overcome the hazard by fire. P. A. MONTGOMERY, Secretary Western Manufacturers' Mutual Ins. Co.

CLINTON, IOWA.—The two No. 8 Fans in our factory do more work with narrower belts and less power than any other fans we have used or seen. CURTIS BROS. & CO.

DETROIT, MICH.—Your No. 4 Exhaust Fan is taking emery dust from ten of our lathes for turning emery wheels. It does its work splendidly, and saves about one-half the power we formerly used.—DETROIT EMERY WHEEL CO., per Gilbert Hart, Manager.

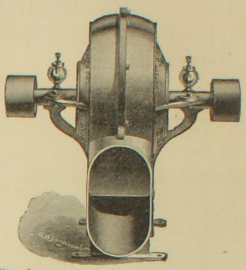
DETROIT, Mich., Feb. 12, 1884.

We have had your patent Exhaust Fan applied to eight cleaning mills and four grindstones at once. Where men could scarcely live before the air is now clear and healthful. MICHIGAN STOVE CO. Per Jeremiah Dwyer, Manager.

HUYETT & SMITH MFG. CO.,

1405 RUSSELL STREET, DETROIT, MICH.

SEND FOR ILLUSTRATED CATALOGUE.



Cupola and Forge Blower—Front View.

# H. W. JOHNS' ASBESTOS LIQUID PAINTS

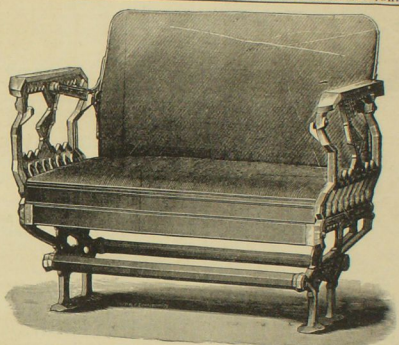
are composed exclusively of the best and purest materials, combined on different principles from any other liquid or Mixed Paints, and are of a higher grade than have ever before been offered to the public, either in "paste" or liquid form, and are second to none in richness and permanency of color, beauty of finish and durability. None but the purest linseed oil and the best pigments enter into their composition. We manufacture forty-eight standard "body" and trimming colors, beside blues, greens, reds, black, etc., etc., and inside and outside whites, and will furnish sample sheets free, by mail, on application.

Roof, Car and Bridge Paints (in Seven Colors). Steam Pipe and Boiler Coverings, Asbestos Rope Packing, Asbestos Wick Packing, Asbestos Flat Packing, Asbestos Sheathing, Asbestos Gaskets, Asbestos Building Felt.

Send for Full Descriptive Catalogue, Samples, etc., etc.

H. W. JOHNS MANUFACTURING COMPANY,

87 MAIDEN LANE, NEW YORK.



## WILSON, WALKER & CO.

(LIMITED),

MANUFACTURERS OF ALL KINDS OF

RAILROAD CAR AND LOCOMOTIVE FORGINGS,

PITTSBURGH. PA.

## THE WAKEFIELD RATTAN CO., BOSTON,

call the attention of Railroad officers and Car-Builders to their new and perfected

RATTAN CAR SEATS AND BACKS.

For long routes and first-class cars the seats we are now making with SPRINGS in both seats an backs, as shown in above cut, are very popular, and are especially desirable for Summer travel, b ein clean, comfortable and cool.

For short routes and smoking cars our regular

RATTAN SEAT AND BACK, without Springs,

has always given perfect satisfaction, as they keep clean, wear longer and have none of the objections that plush and like materials have.

Catalogues and estimates furnished on application to the

WAKEFIELD RATTAN CO.,

115 WASHINGTON STREET, BOSTON

Samples may be seen at the stores of the Company: 8 Park Place, New York; 144 and 146 Wabash Avenue, Chicago; 644 Market Street, San Francisco.

THE SINGER & GOODRICH LUMBER CO.,

IMPORTERS OF

ST. DOMINGO MAHOGANY

SATIN WOOD AND LIGNUM VITÆ,

21st Street & North River, - - - - NEW YORK.

# FRENCH SPIRAL SPRING CO. (LIMITED),

MANUFACTURERS OF

# SPIRAL RAILWAY CAR SPRINGS,

Street Car, Buffer, Freight Bolster,

Journal and Equalizing Bar Springs.

Pennsylvania Railway Co.'s Standard 20-ton Bolster Spring.

BRAKE RELEASE, SWITCH, VALVE AND MACHINERY SPRINGS FROM BEST CRUCIBLE STEEL.

AARON FRENCH, Chairman. GEO. W. MORRIS, Sec'y. CALVIN WELLS, Directing Manager. FRANK S. LAYNG, Treas. WALTER P. HANSELL, Sup't.

Corner of Twenty-Sixth and Liberty Streets, - - - - - PITTSBURGH, PA.

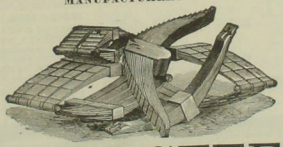
NEW YORK: 115 Broadway, Room 88; H. A. LITTLE, Agt. BOSTON: 4 Mason Bl'g; JOHN KENT, Agt. CHICAGO: 246 Clark Street; J. M. ROGAN. ST. LOUIS: 209 N. Third Street; M. M. Buck & Co., Agents.

CALVIN WELLS. PITTSBURGH AARON FRENCH.

# CAST-STEEL SPRING WORKS

## A. FRENCH & CO.,

MANUFACTURERS OF



EXTRA TEMPERED, LIGHT ELLIPTIC

## CRUCIBLE CAST-STEEL SPRINGS,

WITH PATENT HOT COMPRESSED BANDS FOR RAILROAD CARS AND LOCOMOTIVES.

UNITED STATES CENTENNIAL COMMISSION, OFFICIAL REPORT.—Diploma and Medal awarded for Good Design, Excellence of Workmanship and Material, Uniformity of Action and Durability.

OFFICE AND WORKS: Corner of Liberty and Twenty-first Streets, PITTSBURGH, PA.

H. A. LITTLE, Room 88, Borcel Building, New York; JOHN KENT, 52 Mason Building, Boston;
J. M. ROGAN, 246 Clark Street, Chicago; M. M. BUCK & CO., 209 North Third Street, St. Louis, Mo., Agents.

CALVIN WELLS, President and Treasurer. JAS. K. VERNER, Secretary.

# PITTSBURGH FORGE AND IRON COMPANY,

## Office: TENTH ST., near PENN AVE.,

PITTSBURGH, PA.,

MANUFACTURERS OF HAMMERED

AND

LOCOMOTIVE AXLES.

We make a Specialty of our well-known brand of Railway Axles marked "Special" from new iron, guaranteed to be purely fibrous, and to stand the regulation drop test of the Penna. R. R. Company.

ALSO,

## BAR IRON & BOLTS,

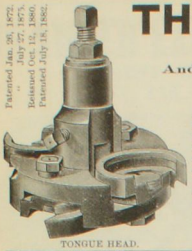
Channel and Angle Iron, Bridge Bolts, plain and upset ends, all sizes, Track Bolts, Square and Hexagon Head Bolts, Rivets, Washers, Fish Plates, Etc.

# THE SHIMER MATCHER HEADS.

THE CHEAPEST! THE STRONGEST! THE MOST DURABLE!

**And yet the Lightest and Easiest Running Matcher Heads in the World. Upward of 12,000 Sold.**

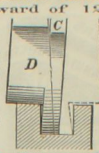
Patented Jan. 26, 1872. " July 27, 1875. Reissued Oct. 12, 1880. Patented July 18, 1882.



TONGUE HEAD.

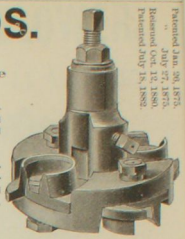
The Bits are arranged in upper and lower series, and secured to a Head having seats alternately inclined for the purpose of giving the side clearance to their cutting points. This explains why these Bits hold their shape and turn out standard work until used up; the entire circle of Bit being tool cutting edge.

This diagram represents a Bit (*D*) in the position it occupies when making a cut; the Bit (*C*) which follows to complete the work is given in outline. This ex plains the division of cut and the free and easy working of the Tool. They finish hard cross-grained and knotty lumber neatly, showing clean-cut edges and *often save their cost in one day's run.*




We also make **Ship Lap Heads, Jointer Heads, Dado Heads, Sash Heads, Door Heads, Cope Heads** and Heads for any special work where a perfectly uniform pattern is required. Send for Descriptive Circular.

Patented Jan. 26, 1875. " July 27, 1875. Reissued Oct. 12, 1880. Patented July 18, 1882.



GROOVE HEAD.

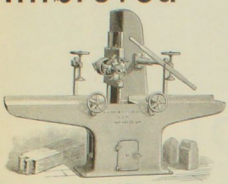
SAMUEL J. SHIMER (Successor to Shimer & Co.), Milton, Penn.

# Improved Wood-Working Machinery

FOR

Railroad, Car and Bridge Shops, Government Arsenals and Navy Yards,

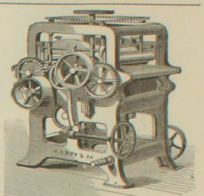
EMBRACING MACHINES FOR



Vertical End Tenoner.

SILL AND TIMBER DRESSING,
PLANING, MATCHING AND BEADING,
MOLDING AND SHAPING,
MORTISING AND BORING,
CAR GAINING,
CAR BORING, ETC., ETC.,

BAND AND SCROLL SAWING,
CIRCULAR AND BAND RESAWING,
SELF-FEEDING RIPPING & CROSS-CUTTING,
ROTARY CAR MORTISING AND BORING,
SAND PAPERING,
CAR TENONING, ETC., ETC.



Sand-Papering Machine.

**Illustrations and Estimates furnished upon application to**

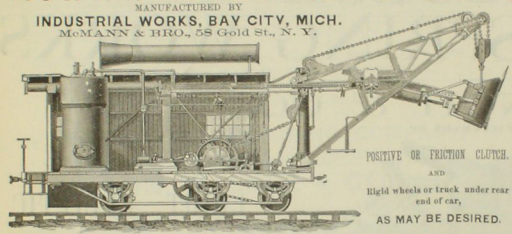
W. H. DOANE, President
D. L. LYON, Secretary.

**J. A. FAY & CO., Cincinnati, Ohio, U. S. A.**

# 1884. IMPROVED IRON STEAM SHOVEL AND DERRICK. 1884.

MANUFACTURED BY

INDUSTRIAL WORKS, BAY CITY, MICH.
McMANN & BRO., 58 Gold St., N. Y.



POSITIVE OR FRICTION CLUTCH.

AND

Rigid wheels or truck under rear end of car,

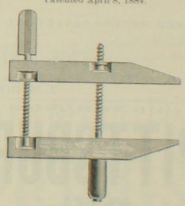
AS MAY BE DESIRED.

References and Recommends:

CHICAGO & WEST MICHIGAN.—"Best machine yet built for railway construction, ballasting or filling of bridges."
MICHIGAN CENTRAL.—"Believe it equal to any shovel manufactured."
NEW YORK CENTRAL & HUDSON RIVER.—"In four months have loaded and delivered on road-bed 94,500 yards at a cost of 5½c. per yard."
PROVIDENCE & WORCESTER.—"Our shovel satisfies us."
HARTFORD & CONNECTICUT WESTERN.—"It has saved us not less than $700 per month over the cost of corresponding work by hand."
FLINT & PERE MARQUETTE.—"Averaged 22,742 yards per month for seven months of 1883."
CHICAGO & GRAND TRUNK.—"Repairs during 1883, about $75.00."
CLEVELAND, MT. VERNON & DELAWARE.—"With more or less unavoidable delay, a ten-mile haul, including *all* expense, has cost us 10c. per yard; a twenty-mile haul, 15c. per yard, and a thirty-mile haul, 20c. per yard."
MEMPHIS & CHARLESTON.—"Have recommended it to many roads."
ILLINOIS & ST. LOUIS.—"In yellow clay our shovel can load 150 cars per day with ease."
DETROIT, LANSING & NORTHERN.—"Gives excellent satisfaction. Unsurpassed as a derrick."

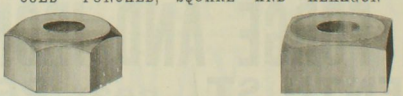
CLEVELAND TWIST DRILL CO. 24-26 WEST ST. CLEVELAND, O.
101 CHAMBERS ST. NEW YORK.

RENO MANUFACTURING CO.,
DETROIT, MICH.,
MANUFACTURERS OF
THE RENO HAND SCREW
Patented April 8, 1884.



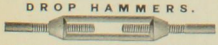
**ADVANTAGES:**
1st. It will outwear any wooden jaw hand screw with wood screws.
2d. It will not swell and refuse to work.
3d. It will not strip in the thread.
4th. It is not as cumbersome.
5th. It works easier and smoother.
Send for circulars and prices of different sizes.
**RENO MFG. CO., Sole Proprietors.**
Detroit, Mich. G. A. BURCH, Manager.

Rhode Island Tool Company,
MANUFACTURERS OF
COLD PUNCHED, SQUARE AND HEXAGON



MACHINERY NUTS
Specially Adapted for the Use of Locomotive and Engine Builders and Machinists Generally.
**Samples Furnished on Application.**
**Small Forgings of all Kinds Made to Order.**
**PROVIDENCE, R. I.**

MERRILL BROS.,
MANUFACTURERS OF
DROP HAMMERS.



DROP FORGED.
Brooklyn, N. Y.

KEYSTONE
Portable Forges,
All sizes, for the lightest to the heaviest work, run by Chain Gear and Flat Belts. Strong, blast and durable. For sale by

Keystone Portable Forge Co.
904 North Fourth St., PHILADELPHIA, PA.

GRANITE ROOFING
(Patented)
FOR STEEP OR FLAT ROOFS. FELT AND BURLAP COMBINED AND GRANITIZED.
**A Finished Roofing Easy to Lay.**
STRONG, ELASTIC, DURABLE AND CHEAP.
Best Roof for Iron Works. Acids and Sulphur have no effect on it.
BEST COVERING FOR OLD SHINGLE ROOFS.
**Send for Circular and Samples. Agents Wanted.**
The Granite Roofing Co., Fifteenth Street and Washington Avenue, Philadelphia, Pa.

The Wellington Belt Holder.

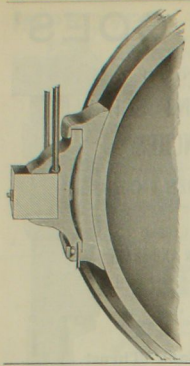
A NEW IDEA!
BETTER and CHEAPER than LOOSE PULLEYS.
BETTER and FAR CHEAPER than DEAD PULLEYS.
**Our Customers Like It and Order More.**
Please write for Circular to
W. R. Santley & Co., Wellington, Ohio.

NATIONAL RAILWAY
PATENT WASTE COMPANY.
The most economical, efficient and desirable material for packing JOURNAL BOXES of CARS is Cotton Seed Hulls.
The company proposes to license railroads to use this valuable article for packing, on very liberal terms
Send for circular to
**H. W. GUERNSEY, President, 240 Broadway, New York.**

OFFICE, 95 LIBERTY STREET, NEW YORK.

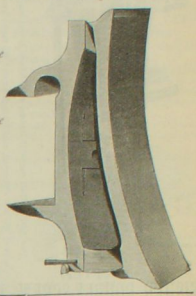
# THE BANNING BRAKE SHOE COMPANY.

WM. H. BARNUM, President. R. M. BASSETT, Sec'y and Treas. J. W. KREPPS, Genl. Manager.



ADVANTAGES:

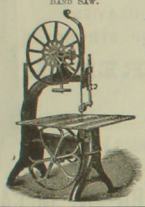
1. *The brake shoe and head are simpler than any other now in use.*
2. *There is the greatest cooling space.*
3. *The BEARINGS being at the EXTREME ENDS of the brake head, the pressure is at the most desirable points.*
4. *There is the least possible friction, and, consequently, less wear on the brake head.*
5. *The shoe itself is the only detachable part.*
6. *It can be taken off DIRECTLY from the side.*
7. *It can be changed without any slackening of the brake rods, and where the shoe swings close to the wheel, as when atmospheric brakes are used.*
8. *There is no interference with the flange of the wheel when the shoe is being removed or replaced.*
9. *A change can be effected in the least possible time.*
10. *The shoe and head can be cast without extra cost.*
11. The head weighs several pounds less than the head of the well-known "Christy" shoe, to say nothing of the expensive wrought-iron curved key used with the Christy.
12. *The fastening is permanent.*
13. *It requires no special fitting, as it can be made of any ordinary rod.*
14. *There are no pins or keys to be fitted, and*
15. *None to be lost or removed when the shoe is changed.*



Sample Shoes Sent on Application. Correspondence Solicited

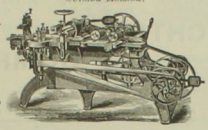
# MANUFACTURERS OF WOOD-WORKING MACHINERY.

BAND SAW.



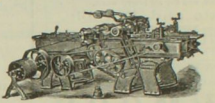
The Latest Improved MACHINERY for Railroad Car Shops.

OUTSIDE MOLDER.

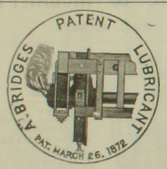


Planers, Vertical Car Tenoners, Gaining, Tenoning, Rotary Mortising Machines.

INSIDE MOLDER.



C. B. ROGERS & Co., MANUFACTORY, NORWICH, CONN. WAREROOMS, 109 Liberty St., New York.




# HOT JOURNALS ENTIRELY PREVENTED.

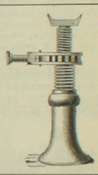
# BRIDGES' LUBRICANT

FOR RAILROAD CAR JOURNALS AND OTHER BEARINGS.

SAMPLES FURNISHED GRATIS. SEND FOR CIRCULAR.

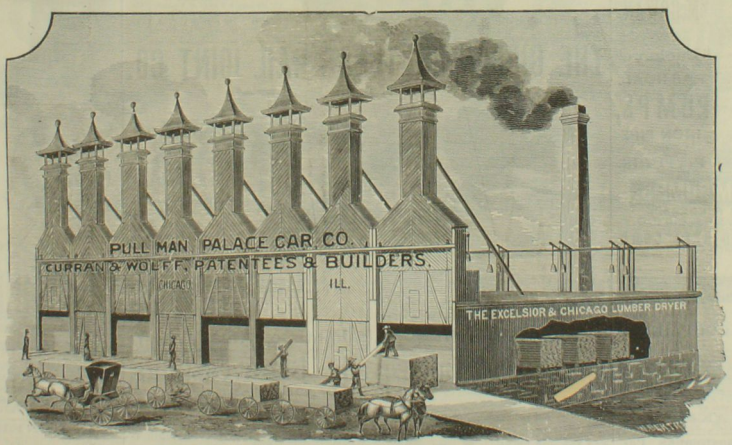
Manufacture Hall's Telescopic Screw Jack.

JOHN S. URQUHART, Successor to ALBERT BRIDGES 46 CORTLANDT STREET NEW YORK.



# THE EXCELSIOR AND CHICAGO LUMBER DRYER IS BUILT UNDER 16 PATENTS.

PAYS FOR ITSELF EVERY YEAR. Storing Capacity 40 000 Feet Inch Lumber.




DRYING 8,000 FEET PINE LUMBER EVERY 24 HOURS.

RAILROAD COMPANIES AND CAR-BUILDERS WHO ARE USING THE EXCELSIOR AND CHICAGO LUMBER DRYER:

| | Kilns | | Kilns | | Kilns |
|---|---|---|---|---|---|
| C. & N. W. R. R. Co., Chicago | 1 | C., B. & Q. R. R. Co., Aurora, Ill | 2 | Harlan & Hollingsworth Co., Car-Builders, Wilmington, Del | 2 |
| B. & M. R. R. R. Co., Omaha, Neb | 1 | N. Y., O. & Western R. R. Co., Middletown, N. Y | 1 | Billmeyer & Small Co., Car-Builders, York, Pa | 1 |
| Norfolk & Western R. R. Co., Roanoke, Va | 2 | Louisville & Nashville R. R. Co., Louisville | 2 | Southern Car Co., Car-Builders, Knoxville, Tenn | 2 |
| Wilmington & Weldon R. R. Co., Wilmington, N. C | 2 | Pullman Palace Car Co., Chicago | 8 | Georgia Car Co., Car-Builders, Cartersville, Ga | 2 |
| Denver & Rio Grande R. R., Denver, Col | 2 | Wells & French Co., Car Builders, Chicago | 3 | Gilbert & Bush Co., Car-Builders, Troy, N. Y | 3 |
| A. T. & S. Fe R. R., Topeka, Kan | 2 | Michigan Car Co., Car-Builders, Detroit, Mich | 2 | Ensign Mfg. Co., Car-Builders, Huntington, W. Va | 2 |
| Flint & Pere Marquette R. R. Co., Saginaw, Mich | 1 | Ohio Falls Car Co., Car-Builders, Jeffersonville, Ind | 2 | Jamieson Car Works, Car-Builders, Detroit, Mich | 2 |
| C., M. & St. Paul R. R. Co., Minneapolis, Minn | 2 | Barney & Smith Mfg. Co., Car-Builders, Dayton, O | 4 | Northern Pacific R. R., Brainerd, Minn | 2 |
| Memphis & Charleston R. R. Co., Memphis, Tenn | 1 | Jackson & Sharpe Co., Car-Builders, Wilmington, Del | 2 | R. & D. R. R., Richmond, Va | 2 |

D. L. WELLS, President. W. B. SHULTE, Vice-President. H. L. NORTON, Sec. and Treas. F. E. WALKER, Engineer

WELLS & FRENCH CO., BRIDGE AND CAR-BUILDERS, CHICAGO, Nov. 13, 1880.

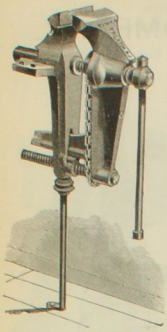
*Messrs. Curran & Wolff, City:*

GENTLEMEN: In reply to your favor inquiring as to the two Dry Kilns you built for us two years ago, we take pleasure in saying that they have given us entire satisfaction. We are drying upward of ten thousand feet of inch boards in each Kiln every twenty-four hours, and the lumber comes out of the Kilns free from checks or damage of any kind resulting from the process. We have concluded to build another of your Dry Kilns, finding them indispensable in our business, and we do not see how any one doing business requiring a large amount of lumber can get along economically without them.

Yours truly, THE WELLS & FRENCH CO.

H. L. NORTON, Sec. and Treas.

CURRAN & WOLFF, Proprietors and Builders, 39 and 41 FRANKLIN STREET CHICAGO, ILL.



Our NO. 6 VISE opens 10 inches, with 8-inch Jaws; has solid forged screws 1¾-inch diameter, with 36-inch lever. We make 5 smaller sizes of same pattern. Special discounts to R. R. Companies and Car Companies on application.

THE
## FISHER DOUBLE-SCREW VISE.
FULLY WARRANTED.

**Stronger than any other Leg Vise**
AND ALWAYS PARALLEL.

The Best Vise for R. R. Machine Shops and Car Builders, and for all heavy work.

Accurate and Durable.

MADE ONLY BY
**THE EAGLE ANVIL WORKS,**
TRENTON, N. J.

---

W. BAILEY LANG,
Sole Agent in the United States and Canadas for the

## LOWMOOR
**IRON COMPANY.**

**Bar Iron** of great strength and uniform quality
**Plate Iron** unequaled for Fire Boxes.
**Tyres, Axles, Chain Rivets, Angle** and **T Iron** and **Forgings**
of all descriptions.

STAY-BOLT IRON.

A full assortment of Bar Iron in store.

50 Beekman St., N.Y. 13 Custom House St., Boston
**THE JOHN H. McCOWAN COMPANY**

---

Cincinnati,
OHIO,
Manufacturers of
**"VICTOR,"**
**"McGOWAN"**
AND
**"Buckeye"**
RAILROAD
## PUMPS,
IRON PIPE
AND
FITTINGS.

---

## RIVAL STEAM PUMPS.
And BOILER FEEDERS.
John H. McCowan & Co., Cin'ti, O.

---

SOLID BRAIDED BELL CORD
PLAIN AND FANCY COLORS

BELL-CORD COUPLINGS.

MANUFACTURED BY
SILVER LAKE CO.
HENRY W. WELLINGTON, Agent, BOSTON

---

## Wrecking and Construction Car.

All the main features, such as leveling car, turntable, self-adjustable step for vertical post, twenty feet hoist, working over embankments, swinging load—car body or more—direct on to freight car, hinged jacks, direct grapples to rail, and other important features, all perfected and patented by Jewett, foreman of a wrecking gang for many years.

For further information apply to the builder,
**HARRISON LORING,**
**Boston, Mass.**

NOTICE.—To build an efficient wrecking car, many of the main features of this car would have to be incorporated into it, which would be an infringement of my patents. Such cars are being built by the undersigned (having special tools for the work) at very reasonable prices, and no charge made for the patent rights, which would have to be paid for by the user if made by an unauthorized person.
HARRISON LORING.

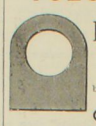
---

## MORSE TWIST DRILL AND MACHINE COMPANY

MANUFACTURERS
Patent Twist Drills, Machine Bits for Wood, Bit Stock Drills, Reamers, Standard Gauges, Milling Cutter and Special Tools, for use in Railroad, Car and Locomotive Shops. **NEW BEDFORD, Mass.**

---

## VULCANIZED FIBRE COMPANY,
SOLE MANUFACTURERS OF
HARD & FLEXIBLE VULCANIZED FIBRE.
Flexible Vulcanized Fibre Dust Guards
and Oil-Box Covers,
being absolutely unaffected by oil or heat, are far more durable and efficient than Leather, and much cheaper.



Office and Works; Wilmington, Del.

---

**OFFICE OF VULCANIZED FIBRE CO.,**
MANUFACTURERS OF
HARD AND FLEXIBLE VULCANIZED FIBRE,
**Tenth and Walnut Streets, WILMINGTON, Del., April 15, 1884.**

The **Gelatinized Fibre Company,** heretofore manufacturing **Fibre Goods** at Brooklyn, N. Y., has been consolidated with this Company, and hereafter we will manufacture all goods at our works in this city, where all the general business of the Company will be conducted.

It will be our aim to maintain and improve the present high standard of our goods, and the manufacture at one point, under one management, with the best known appliances, will enable us to accomplish this result.

**VULCANIZED FIBRE COMPANY,**
FRANK TAYLOR, Supt. and Treas. WM. W. SNOW, President.

---

**PINTSCH** MOSCOW, 1872, Great Gold Medal. VIENNA, 1873, Progress Medal. ST. PETERSBURG, 875, Gold Medal. CINCINNATI, 1881, Gold Medal.

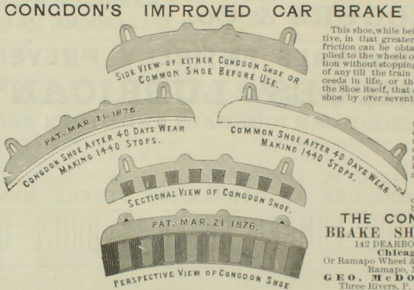
Safety, Economy, Brilliancy.

## LIGHTING COMPANY,
19 William Street, New York.

H. HOWARD, Pres. F. KUHNE, Treas. W. K. JEWETT, Sec'y.

---

## CONGDON'S IMPROVED CAR BRAKE SHOE.




This shoe, while being more effective, in that greater uniformity of friction can be obtained when applied to the wheels of a train in motion without stopping the revolution of any till the train is at rest, exceeds in life, or the durability of the Shoe itself, that of the cast-iron shoe by over seventy-five per cent.

Its durability, together with cheapness and simplicity of construction, recommend it in preference to any other in use

All communications should be addressed to
**THE CONGDON BRAKE SHOE CO.,**
142 DEARBORN ST., Chicago,
Or Ramapo Wheel & Foundry Co., Ramapo, N. Y.
**GEO. McDOUGALL,**
Three Rivers, P. Q., Canada.

---

## THE GIBBON BOLTLESS RAIL JOINT CO.
Of the United States.

**To Lay Track:**

First, place the Rails No 1, then put down No. 2 on No. 1, as shown in No. 4, slide No. 3 into No. 4; spike down, and Joint is complete, as shown in No 5.

The most perfect rail joint in existence. Combines all the Desirable Features of the Old Chair Joints and Modern Angle Plates, and has none of the Objectionable Features of Either.

*NO BOLT HOLES!—No Low Joints!—No Creeping of Track or Spreading of Rails!* ☞ Will save a Large Sum ANNUALLY in Track Maintenance, AS IT DOES AWAY ENTIRELY *with the labor of tightening up and renewing Bolts and Nuts.* ☞ For full particulars, report of Tests, etc., address

The Gibbon Boltless Rail Joint Co., Albany, N. Y.

---

## Manganese Bronze and Brass Castings,
STRONGEST AND BEST IN THE MARKET.

FOR ROLL NECK CAR JOURNAL AND MACHINERY BEARINGS,

ALSO,
**Babbitt's Anti-Friction METAL,**
MANUFACTURED BY
JOHN FITZSIMMONS BRASS FOUNDER 23 CARSON ST., PITTSBURGH, PA.

---

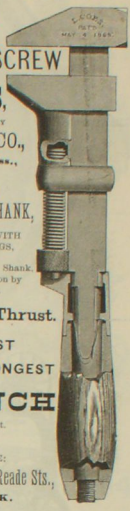
THOMAS V. JOHNSON, 18 Spruce St., New York.

## SOLID LEATHER NAILS.

## Plain and Embossed Upholstery Leathers for Railway Cars
A SPECIALTY.

---

## L. COES'
Improved
PATENT SCREW
## WRENCHES,
MANUFACTURED BY
L. COES & CO.,
Worcester, Mass.,



ENLARGED
BAR JAW AND SHANK,
FERRULE MADE WITH DOUBLE BEARINGS.
Iron Tube Fitted to Shank held rigidly in position by handle and nut.

**No Back Thrust.**

THE HEAVIEST
AND STRONGEST
## WRENCH
In the Market.

WAREHOUSE:
97 Chambers & 81 Reade Sts.,
NEW YORK.

---

## DURRIE & McCARTY
SOLE AGENTS.

---

**RUMSEY & CO.**
**(Limited),**
**SENECA FALLS**
NEW YORK,
Manufacturers of over 800 Different Styles of
**PUMP'S.**
More than 50 railway companies have them in use. Also,
Fire Engines, Etc., Etc.
Ask for Rumsey's Pumps, and address for Catalogue and full information.
**RUMSEY & CO.,**
SENECA FALLS,
**New York.**

---

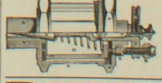
---




COTTERS, SPRING KEYS, BELT HOOKS, D RINGS, STAPLES, ETC.
Manufactured by
**BROWNING, SISUM & CO.,**
Factory, Brooklyn. 85 Chambers St., N. Y. City.

---

**J. E. LONERGAN & CO.**

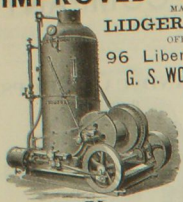


Patent Oilers for Loco. Guides, Rods and Cylinders, Brass Founders and Finishers.
**211 Race st.,**
Philadelphia.
Catalogue free.

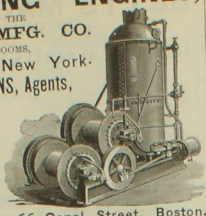
---

## PENFIELD BLOCK CO.
**Pulley Blocks and Iron Sheaves, Phosphor-Bronze Self-Lub. Sheaves ushers, Giant Car, $5.00 each. oor's Manual, 1880-81 and 82. See p. 53. lease write for lists, prices, etc.**
**LOCKPORT, N. Y.**

## IMPROVED HOISTING ENGINES,



MANUFACTURED BY THE
LIDGERWOOD MFG. CO.
OFFICE AND SALESROOMS,
96 Liberty Street, New York.
G. S. WORMER & SONS, Agents,
Chicago, St. Louis and Detroit.

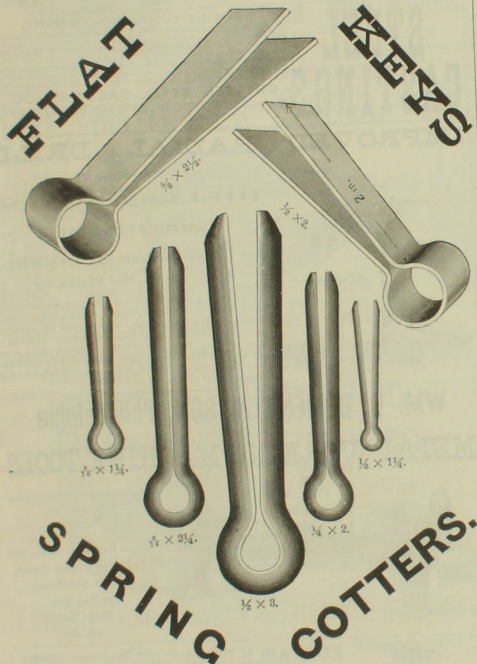


Over 150 different sizes and styles for ALL PURPOSES.

Also
MINING ENGINES,

J. H. HOUGHTON, Eastern Agent, 66 Canal Street, Boston.

## SPRING



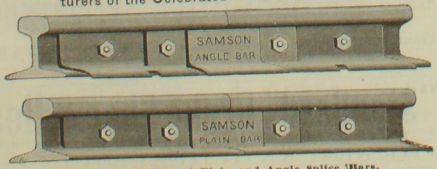

ALL SIZES OF SPRING COTTERS AND FLAT SPRING KEYS
MANUFACTURED BY

## The Whitman & Barnes Mfg. Co.,

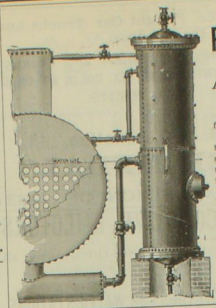
AKRON, O. | SYRACUSE, N. Y.
ST. CATHARINES, ONT. | BOSTON, MASS.

## CHICAGO SPLICE BAR MILL.

MORRIS SELLERS & CO., Sole Proprietors and Manufacturers of the Celebrated "SAMSON" BAR




And Every Variety of Plain and Angle Splice Bars.
OFFICE, 6 ASHLAND BLOCK..... Mill, Chicago Ave. and the River. .....CHICAGO.



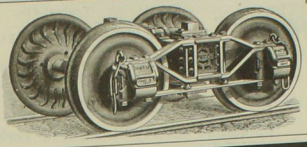
STILWELL'S PATENT
## FEED-WATER PURIFIER.

(Patented March 13, 1883.)

Advantages claimed for STILWELL'S FEED-WATER PURIFIER over all others:

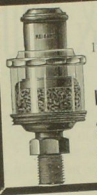
1. It does purify the feed-water and deliver it to the boiler freed from scale-producing elements and sediment.
2. It supplies the boiler with feed-water of about the same temperature as the water in the boiler, which at 90 lbs. pressure, is about 320°, thus preventing the danger arising from unequal contraction caused by injecting feed-water of a lower temperature than the water in the boiler.
3. It can be used equally well with all kinds of boilers, high or low pressure, and whether a steam engine is used or not.
4. It can be used to advantage following feed-water heaters of any kind.

MANUFACTURED EXCLUSIVELY BY
Stilwell & Bierce Manufacturing Co.,
DAYTON, OHIO.



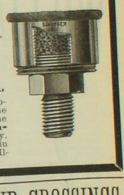
THE THIELSEN TRUCK CO.
142 Dearborn St.,
CHICAGO, ILL.

We respectfully refer you to the following railroads using this Truck: R. & D.; K. C., St. J. & C. B.; M. R., F. S. & G.; C. R. & Q.; C., A. & St. L.; A., T. & S. F.; A. & N. M. R.; F. & P. M.; St. L., I. M. & S.; M. & St. L.; B. & M. R. (in Neb.); D. P.; L., L. & G.; C. V.; S. C.; Baldwin Locomotive Works.

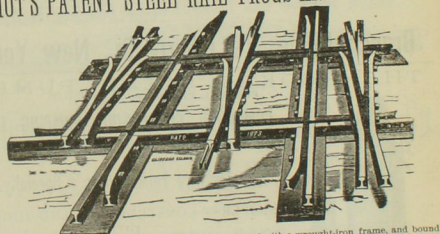


A. EDW. BARTHEL,
ENGINEER,
111 LIBERTY STREET, NEW YORK. P. O. BOX 2837.
SOLE MANUFACTURER OF THE
REISERT, STAUFFER AND BARTHEL
LUBRICATORS AND SOLIDIFIED OIL.

The most economical, perfect, practical, simplest, cheapest and elegantly finished Lubricators ever put on the market. One million sold within a couple of years. The **Barthel Solidified Oil or Lubricating Compound** is used with the **Barthel Lubricators** exclusively. Whoever has once tried this Lubricant will never again use oil or any other lubricating compounds. Send for Illustrated Catalogue.

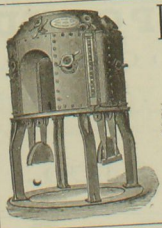


## ELLIOT'S PATENT STEEL RAIL FROGS AND CROSSINGS.



These Frogs and Crossings are made of steel rail, combined with a wrought-iron frame, and bound together transversely with strong bolts, which gives them great strength and durability without destroying their elasticity. They are connected at all ends by Fish-Plate Joints, and lie on the same tie surface as the running rail without any cutting of ties, thus saving a great deal of time and labor in putting in place on track.

Manufactured by H. & H. ELLIOT,
East St. Louis, Ill.



## Important to all Iron Founders.

The COLLIAU IMPROVED CUPOLA

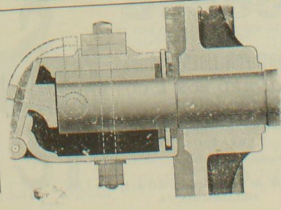
EXCELS ALL OTHERS IN ECONOMY OF FUEL, and rapidity of fusion, avoids delays by not "clogging" or "hanging," and may be run continuously, especially adapted to Car-wheel and Car Casting Manufacturers.

Awarded Silver Medal at Chicago Exposition, June, 1883.

Estimates furnished and correspondence solicited.

Write for Descriptive Pamphlet and mention this paper.

COLLIAU FURNACE CO.,
DETROIT, MICH.



## RAOUL JOURNAL BOX.

This box is designed to provide an end stop for the axle, and thereby dispense with the shoulder and collar, and at the same time not obstruct the process of packing the box. The journal may be made any desired length and diameter. The life of the axle is doubled. The expense of brasses and lubricants enormously reduced; end wear of brasses and hot boxes obviated. It is now in successful operation on trucks of engines, tenders, passenger and freight cars. For further information address

RAMAPO WHEEL & FOUNDRY COMPANY
Ramapo, N. Y.;
Columbus Iron Works Company
Columbus, Ga.

Machines to Bend Arch Bars for Freight Car Trucks and form all kinds of Iron Shapes.

Drop Presses, Staple Bending Machines, Punch and Shears, SIX SPINDLE GANG BORING MACHINES (WILL BORE SIX HOLES AT ONCE), POWER SPRING HAMMERS.

Circulars sent on application. MANUFACTURED BY Correspondence solicited.

WILLIAMS, WHITE & CO., Moline, Ill.

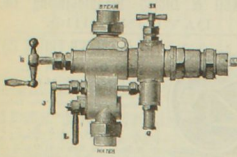
**THREE SILVER MEDALS**

AT THE CINCINNATI EXPOSITION OF 1883

**FRIEDMANN'S PATENT LOCOMOTIVE INJECTORS**

THE "MONITOR," A New Lifting Injector for Locomotives.

Lifting and Non-Lifting, with all Latest Improvements.



EJECTORS FOR WATER STATIONS, Construction Trains, Etc.

OILERS, LUBRICATORS, Etc.

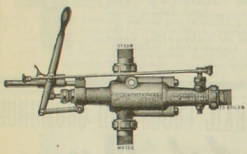
New Patent Boiler Washer and Fire Extinguisher.

NATHAN MFG. CO.,

Send for Descriptive Circular. 92 and 94 Liberty Street, New York.

**WILLIAM SELLERS & CO.,**

PHILADELPHIA.



Iron and Steel Working Machine Tools, for Railways, Machine Shops, Rolling Mills, etc.

Pivot Bridges—Shafting.

The 1876 Injector Boiler-Feeder.

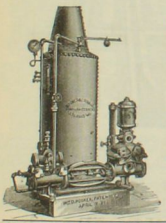
Simple, Reliable and Effective.

Started, Regulated and Stopped by one Motion of a Lever.

Pneumatic Fire Extinguisher, for use in Passenger and Freight Cars, Buildings, etc.

**Branch Office, 79 Liberty St., New York.**

THE HOOKER STEAM PUMPS, FOR ALL PURPOSES.



COMPOUND CONDENSING PUMPING ENGINE FOR WATER-WORKS.

Railway Tank Pumps a Specialty.

SIMPLEST CONSTRUCTION AND HIGHEST DUTY.

Office and Works, 823 North Second St., St. Louis, Mo.

SEND FOR CATALOGUE.

THE HOOKER-COLVILLE STEAM PUMP CO.

**KRUPP COMPOUND.**

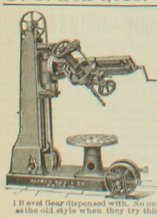
THE STANDARD COOLER.

This compound as a cooler and lubricator for **Hot Journals** is unsurpassed.

Is best applied as a dope by mixing well with waste saturated with oil, and packing close to the journal.

**E. A. SMITH & CO.,**

P. O. Box 1,145. Pittsburgh, Pa.



1 Bevel Gear dispensed with. No one sees the old style when they try this.

ALL SIZES OF CHAIN TO RUN IN SPROCKET WHEELS.

NORTHERN LIBERTY WORKS.

ALFRED BOX & CO.,

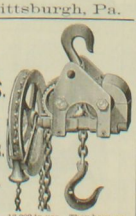
MANUFACTURERS OF

Double Screw Hoists, Radial Drills.

ELEVATORS, ETC.

(Awarded Three Silver Medals and Five Diplomas.)

314 & 316 Green Street, PHILADELPHIA, PA.



12,000 in use. They have no equal.

**BETTS MACHINE COMPANY,**

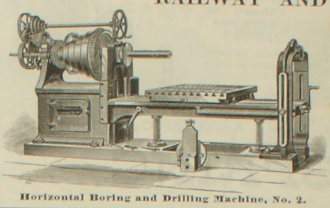
Wilmington, Del.,

MAKERS OF

HEAVY MACHINE TOOLS

FOR USE IN

RAILWAY AND CAR SHOPS.



Horizontal Boring and Drilling Machine, No. 2.

Radial Drills, Engine Lathes, Wheel Borers, Wheel Lathes, Wheel Presses, Slotters Planers

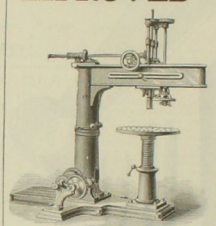
**STEEL CASTINGS**

FROM 1-4 To 10,000 lbs. WEIGHT.

True to pattern, sound and solid, of unequaled strength, toughness and durability. An invaluable substitute for forgings or cast-iron requiring three-fold strength. Gearing of all kinds, Shoes, Dies, Hammer-Heads, Cross-Heads for locomotives, etc. 15,000 Crank Shafts and 10,000 Gear Wheels of this steel now running prove its superiority over other steel castings. CRANK SHAFTS, CROSS-HEADS and GEARING specialties. Circulars and Price Lists free.

CHESTER STEEL CASTINGS CO., Works CHESTER, Pa. 407 Library St., PHILADELPHIA. C. HUBBARD, Agent, 46 Cliff Street, New York.

**IMPROVED RADIAL DRILL**



MANUFACTURED BY

HILLES & JONES,

WILMINGTON, DEL.

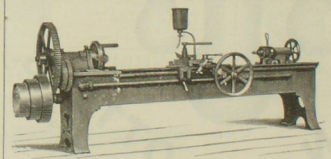
For Fitting up Steam Engine Cylinders, Steam Chests, Bed Plates, etc.

The radiating-arm traverses freely in all directions, carrying drill, spindle and gearing backward and forward by rack and pinion and hand wheels. The arm can be placed in any position, radiating from column as a center, enabling large number of holes to be drilled in succession on the same surface without moving the work. Each machine is double back-geared, with automatic feed motion. Extension base plate is planed off true and slotted. FOUR sizes.

**WM. B. BEMENT & SON, Philadelphia**

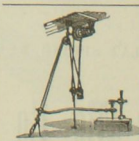
MANUFACTURERS OF

METAL WORKING MACHINE TOOLS



Of all descriptions, and a great number of sizes, including

Steam Hammers, Steam and Hydraulic Riveters, Cranes, Punches and Shears, Bending Rolls, Plate Planers, etc.



PORTABLE Machines for Use by Bridge, Engine and Boiler Makers.

PORTABLE Drilling, Tapping, Boring, and Reaming Machines

PORTABLE Machines for Wood Boring, Polishing, and Emery Wheel Grinding.

STOW FLEXIBLE SHAFT Co., Limited,

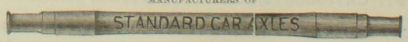
1505-1509 PENNSYLVANIA AVENUE,

PHILADELPHIA, - - PA.

GEO. E. SACKETT, Pres. J. T. WRIGHT, Supt.

**New Albany Steam Forge,**

MANUFACTURERS OF




AND

Crank Pins, Equalizers, Slide-Bars, Connecting, Parallel and Piston Rods. Heavy Forgings of all Kinds of Iron and Steel.

Office and Works, New Albany, Ind.

**"Standard" Brake Shoe & Head**

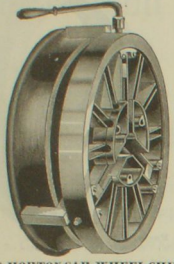
This device is being adopted by leading lines and is conceded without exception to be

THE BEST AND CHEAPEST IN USE!

Patent approved by Western Railroad Association.

☞ Write for Circular and prices. STANDARD MFG. CO., Ft. Wayne, Ind.

THE E. HORTON & SON CO.,
Windsor Locks, Conn., U. S. A.,
Only Manufacturers of the Universally used
**Horton Lathe and Car Wheel Chucks.**
☞ The only Chucks made that use the PATENT JAW, with both face and bite of Jaws ground perfectly true. Send for Illustrated Catalogue.



THE HORTON CAR WHEEL CHUCKS.
FROM 30 TO 42 INCHES.
This cut represents the Horton Car Wheel Chuck holding a car wheel in proper position for boring, the flange and tread of the wheel assuming a true position on the jaws.

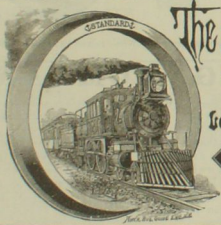
**Best Chilled Iron**
CAR WHEELS

MANUFACTURED BY
CAYUTA WHEEL AND FOUNDRY CO.
WAVERLY N. Y.
MOSES LYMAN, - - Treasurer.
LEWIS H. TAYLOR, Pres.
S. P. RABER, Sup't. and Treas.
L. S. VANDERBEEK, Sec. and Asst. Treas.
New York Office, - - 91 Liberty st.

**TAYLOR IRON WORKS,**
High Bridge, N. J.,
MANUFACTURERS OF
Chilled Iron Car-Wheels, Steel-Tired Wheels, Car and Locomotive Axles and Draw Hooks.

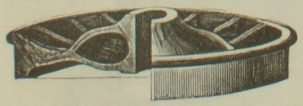
**THE MIDVALE STEEL CO.**
A. G. TOMPKINS & CO., Boston.
CORNELIUS, CARPENTER & CO., Providence, R. I.
H. R. ROGERS, New York.
W. H. WALLACE & CO., New York.
THOMAS PROSSER & SON, New York.
CHERRAH ADAMS & CO., Chicago.
POST & CO., Cincinnati.
W. & A. G. SEMPLE, Louisville.
GEO. A. SMITH, Richmond.
T. GUILFORD SMITH, Buffalo.

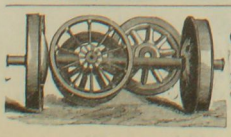
Works & Office: Nicetown, Philadelphia, Pa.
Warehouse: 12 North Fifth st., Philadelphia, Pa.
TIRES AND AXLES OF EVERY DESCRIPTION.
**HEAVY CASTINGS AND FORGINGS.**


**The STANDARD STEEL WORKS.**
Manufacturers of
Locomotive and Car Wheel
**TIRES.**
Office 220 South Fourth St.,
PHILADELPHIA, PA.

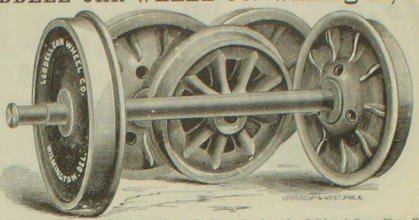
LEHIGH CAR MANUFACTURING COMPANY
MANUFACTURERS OF
Box, Gondola, Flat, Coal, Ore Drift or Mine Cars. Capacity, 16 Cars Per Day.
Stemton, Northampton Co., Pa. New York Office, 91 Liberty St., Room 4.
H. H. FISHER, President. G. H. STEM, Supt. R. E. LEHMAN, Vice-President

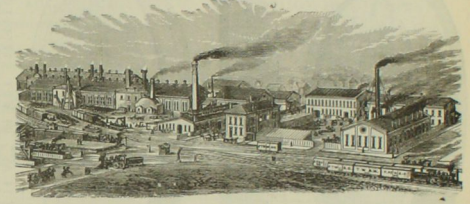
| Established 1852. | Albany Car-Wheel Works. | Albany, N. Y. |
|---|---|---|
| GEO. H. THACHER & CO. | CAR WHEELS AND Engine Wheels. | MANUFACTURED FROM The Best Brands OF CHARCOAL IRON ONLY. |


**WASON MANUFACTURING CO.**
SPRINGFIELD, MASS
BUILDERS OF
**RAILWAY CARS OF ALL DESCRIPTIONS,**
CAR WHEELS AND RAILWAY CASTINGS.
H. S. HYDE, Treasurer. G. C. FISK, President.


**MOWRY CAR WHEEL WORKS,**
CINCINNATI, O.
Manufacturers of CAR WHEELS of all descriptions, Wheels and Axles, Chilled Tires, Engine, Car and Bridge Castings, of any pattern, furnished to order at short notice. Wheels of all sizes constantly on hand.
OFFICE: No. 274 W. Third St., Cincinnati, O.
WORKS: Eastern Avenue and Lewis Street.
L. A. GREEN, Sup't, Cincinnati, O.

ESTABLISHED 1847.
A. WHITNEY & SONS'
**CAR WHEEL WORKS,**
PHILADELPHIA, PA.

**LOBDELL CAR WHEEL CO. Wilmington, Del.**

Single and Double Plate and Hollow Spoke Wheels for Steam Roads. Also, Solid and Open Plate Wheels for Street Roads. Wheels with Turned Threads, under the Patent of "W. W. Lobdell."
GEO. G. LOBDELL, President. W. W. LOBDELL, Secretary. P. N. BRENNAN, Treasurer.

ESTABLISHED 1853. INCORPORATED 1873.
BASS FOUNDRY AND MACHINE WORKS.
MANUFACTURERS OF
Steam Engines, Boilers, Heavy Machinery, Car Wheels and Railroad Castings.

J. H. BASS, President. J. I. WHITE Secretary R. J. FISHER, Treasurer.
FORT WAYNE, IND.

THE JERSEY CITY WHEEL FOUNDRY AND MACHINE WORKS.

MANUFACTURERS OF CAR WHEELS.
P. O. Box 139, Jersey City, N. J.

**Northwestern Manufacturing and Car Co.,**
CAR-BUILDERS.
**CAPACITY, 15 BOX CARS PER DAY.**
STILLWATER MINNESOTA.

**CARLISLE MANUFACTURING CO.,**
MANUFACTURERS OF
FREIGHT CARS, BOX, STOCK, GONDOLA, IRON HOPPER, COAL and MINING CARS,
ENGINES and MILL MACHINERY,
CARLISLE, PA.

**THE HARLAN & HOLLINGSWORTH CO.,**
CAR BUILDERS,
WILMINGTON, DEL.
Established in - - - - - - 1836.

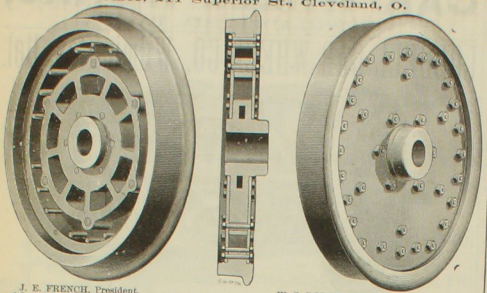
**UNION FOUNDRY**
AND
PULLMAN CAR WHEEL WORKS,
CHICAGO, ILL.
MANUFACTURERS OF
Car and Engine Wheels, Wheels and Axles,
AND ALL CLASSES OF
CASTINGS FOR RAILROAD PURPOSES.

## PAICE CAR WHEEL CO.,

MANUFACTURERS OF

PAIGE'S PATENT WROUGHT METAL WHEELS.

Office, 211 Superior St., Cleveland, O.



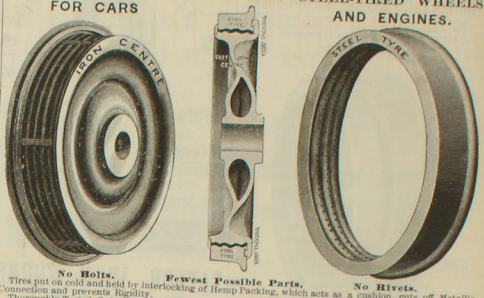
J. E. FRENCH, President. W. S. DODGE, Secretary and Treasurer.

Adapted for Sleeping and Drawing Room Cars, Locomotive and Tender Trucks. Steel Tires, four inches thick, with ½ inch Plates, securely bolted, making it a perfectly Safe, Durable and Noiseless Wheel.

## ATWOOD HEMP CAR WHEEL CO.,

MANUFACTURERS OF

ATWOOD PATENT HEMP-PACKED STEEL-TIRED WHEELS FOR CARS AND ENGINES.




No Bolts. Fewest Possible Parts. No Rivets.

Tires put on cold and held by interlocking of Hemp Packing, which acts as a cushion, cuts off Metallic Connection and prevents Rigidity.

Thoroughly Tested, Safest, Cheapest and Most Noiseless of all Steel Tired Wheels.

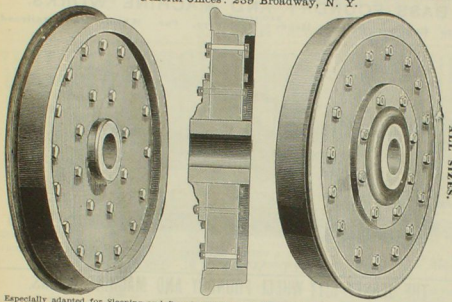
JOS. W. DREXEL, President. ROBERT F. SHEPARD, Secretary and Treasurer.

OFFICE: 59 LIBERTY STREET, NEW YORK.

C. W. LEAVITT & CO., SELLING AGENTS, 161 BROADWAY.

## ALLEN PAPER CAR WHEEL COMPANY.

General Offices: 239 Broadway, N. Y.



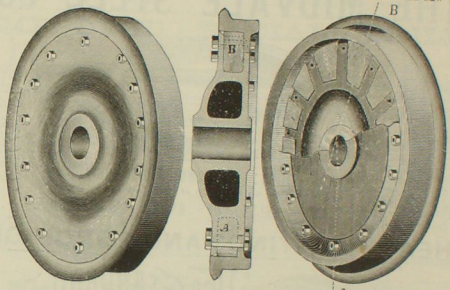
MANUFACTURERS OF ALLEN'S PATENT PAPER CAR WHEEL. ALL SIZES.

Especially adapted for Sleeping and Drawing-Room Cars, Locomotive and Tender Trucks. Steel Tire with Annular Web—Strongest, Most Durable, and Most Economical Wheel in use. Works at Hudson, N. Y., and at Pullman (near Chicago), Ill.

A. G. DARWIN, President. J. C. BEACH, Treasurer. C. H. ANTES, Secretary.

## THOMAS' PATENT STEEL-TIRED WHEEL.

NOISELESS, ABSOLUTELY SAFE, INDESTRUCTIBLE WOOD BEARING FOR TIRE, READILY REFITTED WITH NEW TIRE.




Address THEODORE THOMAS, care the Jersey City Wheel Foundry and Machine Works, P. O. Box 129, Jersey City, N. J.

## CHILLED CAR WHEEL GRINDING COMPANY.

H. M. YERRINGTON, President. Patented in United States and Canada. G. F. FORD, Secretary and Treasurer.

A. C. ELLIS, Vice-President.

The GOWAN CHILLED CAR WHEEL GRINDING MACHINE, which we now introduce, is no hasty device. It is the result of four and one-half years' experience, and during that time has received a most thorough test, with satisfactory results.

Railroad officials, upon reflection, will admit it is more essential to have a machine to true up Chilled Car Wheels than a Tire Lathe for turning locomotive tires, for this reason: four or more driving wheel tires are required for one engine; a greater number of Car Wheels compose a train; hence the necessity of this invention.

The great hardness of the chilled tread has hitherto rendered the operation of turning them impracticable, owing to the great expense, which made it cheaper to frequently replace the worn wheels with new ones. To obviate these objections and reduce the cost of this process, we furnish a machine capable of making a perfect wheel at small expense.

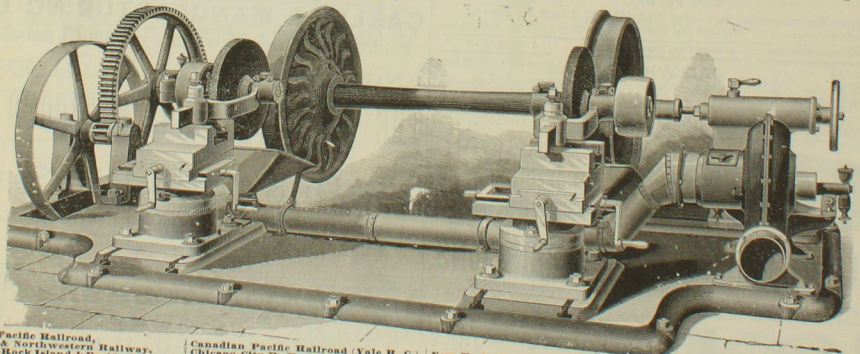
Wheels with flat places, and otherwise badly worn, that are ordinarily condemned and used for scrap iron, can be ground and fitted so as to double their original mileage. This alone makes our machine the greatest money saver ever introduced to railroads.

A sound Chilled Car Wheel trued by our method cannot be excelled by a paper or any other description of Car Wheel with steel tire.

Any person having a slight acquaintance with tools may, after five hours' instruction, become thoroughly competent to operate our machine.

Allowing all new wheels to be 3-32 inch oval, if properly fitted to axles, our machine *will* true up one pair an hour.

We manufacture expressly for use with our machine, Abrading Wheels, which, as the result of a series of experiments and long experience, we guarantee to be the best grinding wheels made. No odor, no glaze, and we defy competition.



Central Pacific Railroad,
Chicago & Northwestern Railway,
Chicago, Rock Island & Pacific Railway,
Virginia & Truckee Railroad,
Pennsylvania Railroad,
Denver & Rio Grande Railway,
Chicago, Milwaukee & St. Paul Railroad.

Canadian Pacific Railroad (Yale R. C.),
Chicago City R. R., Cable Road,
New York & New England Railroad,
Union Pac. Ry. (Denver & S. Park Div.),
South Pacific Coast Railroad,
Nevada County Narrow Gauge Railroad,
Chicago City Railway (South Division),

New York, Ontario & Western Railway,
Lehigh Valley Railroad,
Pullman P-lace Car Company,
Allegheny Valley Railroad,
Chicago City Railway (West Division),
Carson & Colorado Railroad,
Lake Tahoe Narrow Gauge Railroad,

J. Harris & Co., St. Johns, N. B.
Baltimore & Ohio Railroad,
New York, Lake Erie & Western,
New Brunswick Wheel Foundry, St Johns, N. B.
New York Central R. R., Harlem Div.
New York, New Haven & Hartford R. R.

We are prepared to sell machines outright, or to furnish them on royalty for each pair of wheels trued.

CHILLED CAR WHEEL GRINDING COMPANY, CARSON, NEVADA.

Address

JOHN H. HAPGOOD, General Agent, Grand Pacific Hotel, Chicago, Ill.

# THE GOWAN

# CAR WHEEL CENTERING, BORING AND TRUING MACHINE,

MANUFACTURED AND SOLD EXCLUSIVELY BY THE

# GOWAN CAR WHEEL TOOL COMPANY,

CHICAGO, Under { Letters Patent No. 285,123. Granted Sept. 18, 1883. / Letters Patent No. 287,762. Granted Oct. 30, 1883. } ILLINOIS.

Great Economy of Time, Labor, Tools, Power and Shop Space. The Mileage of Wheels Largely Increased and Flange Wear Greatly Decreased. The Only Machine Capable of Boring the Hub and Truing the Tread of a Car Wheel at One Operation.

It will True (boring simultaneously) a chilled iron wheel in less time and deprive its tread of less of its integrity than any other Truing Machine in existence.
It will simultaneously Bore and True a steel-tired wheel *with greater rapidity and cut away less of its tread* than any known tool, or system of tools, for such purpose.
It will Bore a Chilled-Iron or Steel-tired Wheel *without truing the tread*, or True the tread *without boring;* embodying in combination, or independently, all the requisites of a Boring Mill, Chilled Car Wheel Grinding Machine and Tire Lathe.

**Master Mechanics and Master Car-Builders fully appreciate the following Facts:**

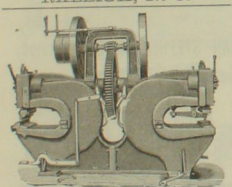
That wheels can not be cast to a true circle, and though registering exactly the same circumference in the rough, invariably differ in size when relieved of their peripheral irregularities.
That if circumferentially matched, rough Cast Wheels are bored and pressed upon their axle, one wheel of the pair being more oval than its fellow, and becoming the smallest of the pair, when both are reduced to a round, the best wearing surface must necessarily be cut from the chilled tread of the other, and best wheel, in order to make it conform in size to its mate.
It prepares the wheel for its axle; circumferential *admeasurement for pairing being made after wheels are bored and trued.*
It is a Simple, Compact and Reliable Machine, weighing 17,000 pounds, and occupying a floor space 10 × 8 feet.

FOR FURTHER PARTICULARS ADDRESS

## THE GOWAN CAR WHEEL TOOL COMPANY,

P. O. Drawer 176. CHICAGO, ILL.

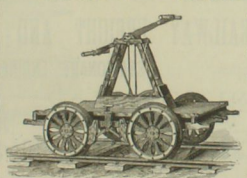
THE
NORTH CAROLINA
CAR COMPANY.
Standard and Narrow-Gauge Freight Cars
RALEIGH, N. C.



Power Punches, Shears & Hammers.
We make over 100 sizes of Punches and Shears, Double and Single, varying from 500 to 30,000 pounds in weight, and adapted for every variety of work. The Double machines are equal to two Single ones, as each side is worked independently. Also
ADJUSTABLE HELVE CUSHIONED HAMMERS
Of all sizes, Unequaled for Efficiency and Durability.
THE LONG & ALLSTATTER CO.,
Hamilton O.

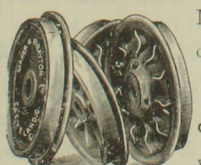
FOR SALE.
SPECIAL LIST OF RAILROAD AND CAR-SHOP MACHINERY.
BUT VERY LITTLE USED.
One Iron Planer, to plane 17 feet long, 42×42 in.' Bement's make, second-hand.
One Iron Planer, to plane 16 feet long, 42×42 in., Bement's make, second-hand.
One Iron Planer, to plane 12 feet long, 36×36 in., Bement's make, second-hand.
One Iron Planer, to plane 11 feet long, 30×35½ in., Bement's make, second-hand.
One Car Wheel Boring Machine, for 42-in. wheels, made by Wm. B. Bement & Son, perfect condition.
One Car Wheel Boring Machine, for 42-in. wheels, made by Wm. B. Bement & Son, good condition.
One Car Wheel Boring Machine, for 42-in., with hub facing attachment, S. Y. Steam Engine Co., good condition.
One Double Axle Lathe, made by Niles Tool Works, excellent order.
Two Axle Lathes, made by Fitchburg Machine Co., very good order.
One Hydraulic Car Wheel Press, good order.
Two Lewis, Oliver & Phillips' Two Spindle Bolt Cutters, very good order.
One Six Spindle Drill, made by Wm. B. Bement & Son, very good order.
One Darrell Seven-Spindle Nut Tapping Machine, almost new.
One Darrell Seven-Spindle Nut Tapping Machine, excellent order.
One Hydraulic 78-in. Driving Wheel Press, good condition.
One 25 in. by 12 ft. bed Engine Lathe, Bement's, excellent order.
Two Upright Drills, 42 in., Bement's, good condition.
THE GEORGE PLACE MACHINERY CO.,
121 CHAMBERS AND 103 READE ST., NEW YORK.

## THE "SHEFFIELD"

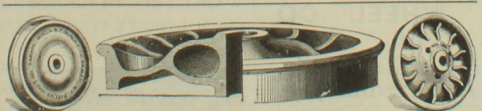


Wood Wheel Hand Cars and Push Cars.
STANDARD AND NARROW-GAUGE.
The Lightest, Most Durable, Easiest and Quickest Running Car in use.
SEND FOR ILLUSTRATED PRICE-LIST.
FAIRBANKS & CO.,
Sole Agents,
311 Broadway, New York.
We also furnish One Man and Two Men Velocipedes.

## CLEVELAND WHEEL AND FOUNDRY WORKS,

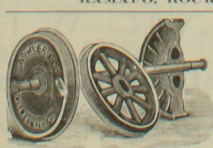


MAHER & BRAYTON, Proprietors.
MANUFACTURERS OF
CAR, ENGINE, TRUCK AND TENDER WHEELS, RAILROAD, ROLLING-MILL AND MACHINERY CASTINGS, AND STREET RAILROAD WHEELS AND TURNOUTS.
ALSO,
CHILLED-FACED RAILROAD FROGS.
Office: 20 Carter Street.
Works: Cor. Carter and Collins Streets, Cleveland, O.



## RAMAPO WHEEL AND FOUNDRY COMPANY,

MANUFACTURERS OF
Chilled Wheels for Drawing-Room and Sleeping Coaches, Locomotives, Tenders, Passenger and Freight Cars.
GEO. CHURCH, President and Treasurer. W. W. SNOW, Superintendent and General Manager.
RAMAPO, ROCKLAND COUNTY, N. Y.



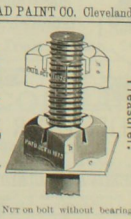
## CLEVELAND FOUNDRY.

Car Wheels of All Kinds and Sizes
WITH OR WITHOUT AXLES.
CHILLED-FACED RAILROAD FROGS.
Street Railroad Turnouts.
ROLLING MILL AND MACHINERY CASTINGS.
Nos. 9, 11 and 13 Winter St., Cleveland, O.
BOWLER & CO.

IRON CLAD PAINT.

Trade-Mark Patented.
**This Paint is used by nearly all the Railroads in the Country.**
Used by L. S. & M. S., Wabash Ry., C., C., C. & I. R'y, C. & P. R'y, C., H. & D. R. R., Cincinnati Southern R'y, N. Y., L. E. & W. R'y, (Erie), Southern Central R. R., Canada Southern, Mobile & Ohio, N. O. & Mobile, Macon & Brunswick, Penn. R. R., C., M. & St. P. R'y, A. & N. R'y, R. & D. R'y, Carolina Central, P., C. & St. L. R'y, P. & E. R. R., M., L., S. & W. R'y, K. & D. M. R'y, W. C. & A. R. R., M. I. & N. R'y, N. C. & St. L., N. L. & E. R. R., I. & G. N. R. R., etc., etc.
IRON CLAD PAINT CO. Cleveland Ohio.

Atwood Safety Nut Co., Springfield, Mass.



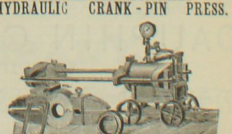
J. W. LARRABEE, Treasurer.

a. ATWOOD NUT on bolt without bearing on base slots open.
b. ATWOOD NUT turned to bearing e partially closing the slots and grasping the bolt.

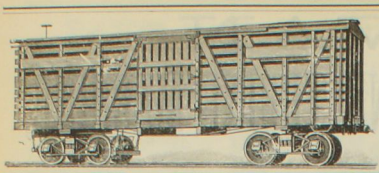
## ST. CHARLES CAR CO.,

ST. CHARLES, MO.
Freight Cars of every Description.
Capacity, 15 Cars per day.

PORTABLE AND ADJUSTABLE
HYDRAULIC CRANK-PIN PRESS.



CAN PRESS OFF OR ON CAR WHEELS
Large Presses Built to Order.
Send for Circulars or Photograph to
I. C. SCHAFFER 129 Mill St., ROCHESTER, N. Y.



# LA FAYETTE CAR WORKS,

LAFAYETTE, IND.

Freight Refrigerator and Caboose Cars of all kinds. Hand and Push Cars.

Warehouse Trucks and Baggage Barrows, Car Wheels and Castings.

B. F. MASTEN, Prest. C. E. GORE, Supt.

---

MANUFACTURERS OF

## CARS,

Car Wheels, Truck Wheels and Tender Wheels,

Hammered Car and Locomotive Axles and General Forgings.

**Car Wheels Fitted to Axles.**

Car Castings, Fridge Castings and Car Brasses.

**Mining Cars, Mining Wheels, Etc.**

W. H. BARNUM, President, Lime Rock, Conn. F. E. CANDA, Vice-President, New York City. E. ENSIGN, Secretary and Treasurer, Huntington, W. Va.

# The Ensign Manufacturing Company

(CAR WORKS, FOUNDRIES AND STEAM FORGE).

DAILY CAPACITY, - - - - - - - - - - 15 Box Cars, 250 Car Wheels, 80 Axles.

HUNTINGTON, WEST VIRGINIA.

---

# WASON

CAR AND FOUNDRY CO.,

CHATTANOOGA, TENN.

MANUFACTURERS OF

FREIGHT CARS, CAR WHEELS AND CASTINGS OF ALL KINDS.

---

BRADLEY CAR WORKS, WORCESTER, MASS.

**ESTABLISHED 1833.**

MANUFACTURERS OF EVERY DESCRIPTION OF

## RAILWAY CARS.

OSGOOD BRADLEY & SONS, Proprietors.

NEW YORK OFFICE No. 115 Broadway, R. CANNING, Agent.

---

## WM. E. UPTEGROVE & BRO.

**MAHOGANY** All Veneers and Cabinet Woods. FRENCH BURL VENEERS A Specialty.

SAW MILLS AND OFFICE Foot 10th & 11th Streets, East River, NEW YORK.

---

---

## LITCHFIELD CAR AND MACHINE COMPANY,

LITCHFIELD, ILLINOIS,

Manufacturers of all kinds of Passenger and Freight Equipment, both Wide and Narrow Gauge.

CAR WHEELS A SPECIALTY IN THE MACHINERY DEPARTMENT.

Especial attention is given to furnishing Hoisting Engines, Pit Cars, Dumps, etc., etc., for Coal Mines, as well as building Stationary Engines and Boilers, and General Brass and Sheet-Iron Work.

---

## KNOXVILLE CAR WHEEL CO.,

Knoxville, Tenn.,

MANUFACTURE

CHILLED WHEELS FOR CARS,

ENGINE TRUCKS AND TENDERS,

USING STRICTLY

COLD BLAST CHARCOAL IRON,

Made at their Celebrated Carter Co. Furnaces.

---

MICHAEL SCHALL. S. J. SHOOP.

## DAUPHIN CAR WORKS,

DAUPHIN, PA.

Freight, Coal, Dump, and Mine Cars. Capacity six cars per day.

---

I. N. PENNOCK. W. PENNOCK.

## PENNOCK BROS.,

MANUFACTURERS OF

RAILWAY CARS,

MINERVA, OHIO.

---

## PARDEE CAR WORKS,

WATSONTOWN, PA.

PARDEE, SNYDER & CO. (Limited), Proprietors.

C. W. LEAVITT, Agent, 161 Broadway, Room 2, N. Y.

---

## SOUTHERN CAR WORKS,

MANUFACTURERS OF

RAILROAD CARS,

Box, Flat, Gondola, Ore, Mining, Etc.

KNOXVILLE, TENN.

---

## ERIE CAR WORKS (LIMITED).

ERIE, PA.

Capacity 16 Cars Per Day.

FREIGHT CARS OF BEST MATERIAL, AND CONSTRUCTION A SPECIALTY

GEO. C. KIMBALL, President. EDWARD HILL, Agent

---

## MUSKEGON CAR & ENGINE CO.,

MANUFACTURERS OF

RAILWAY FREIGHT AND PASSENGER EQUIPMENT

STATIONARY ENGINES AND BOILERS,

MUSKEGON, - - - - - MICH.

---

## HARRISBURG CAR MANUFACTURING CO.

MANUFACTURE

PASSENGER MAIL, BAGGAGE

BOX, GONDOLA, COAL

AND ALL OTHER KINDS OF

RAILROAD CARS;

Railroad Car Wheels and Castings, Bridge and Rolling Mill Castings, Bridge Rods, Bolts and

RAILROAD FORGINGS.

---

## JOHN STEPHENSON CO., Limited,

## STREET CARS

And Omnibuses.

47 East Twenty-Seventh St, N. Y.

---

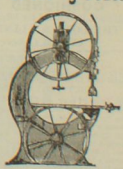
## Wood Working Machinery and Iron Tools.

S. A. WOODS MACHINE CO.,

WAREROOMS: 172 HIGH STREET, BOSTON.

91 LIBERTY STREET, NEW YORK.

61 SOUTH CANAL ST., CHICAGO.



Special Machinery for the use of Car-Builders and R. R. Shops.

---

## DAVENPORT, FAIRBAIRN & CO.,

ERIE, PA.

MANUFACTURERS OF

CAR WHEELS

Capacity 350 Wheels per day. Wheels made by improved process. Far more durable than those made in the ordinary way.

---

## Railroad Journal Bearings

BRASS CASTINGS.

BABBITT METAL.

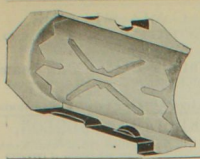
SOLDERS.

DEALERS IN

All Kinds of Metals.

J. J. RYAN & CO.,

62 & 64 West Monroe Street, Chicago



## F. W. THAYER & CO.,

SOLE MANUFACTURERS

## Thayer's Patent Journal Bearings,

418 TO 422 FOWLER STREET,

MILWAUKEE, - - - - - - - - WIS.

We refer by permission to the CHICAGO, MILWAUKEE & ST. PAUL RAILWAY, who have adopted our bearings over all others.

Patented April 8, 1884.

## PATENTS

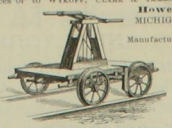
MUNN & CO., of the SCIENTIFIC AMERICAN, continue to act as Solicitors for Patents, Caveats, Trade Marks, Copyrights, for the United States, Canada, England, France, Germany, etc. Hand Book about Patents sent free. Thirty-seven years' experience. Patents obtained through MUNN & CO. are noticed in the SCIENTIFIC AMERICAN, the largest, best, and most widely circulated scientific paper. $3.20 a year. Weekly. Splendid engravings and interesting information. Specimen copy of the Scientific American sent free. Address MUNN & CO., SCIENTIFIC AMERICAN Office, 261 Broadway, New York.

JOSIAH M. CLARK

[Successor to WYKOFF, CLARK & IDDEN],

Howell, MICHIGAN,

Manufacturer of



STANDARD AND NARROW-GAUGE

HAND-CARS,

Railroad, Steamboat and Warehouse Trucks, Baggage Barrows, Grain Wagons, and Willis' Patent Car Pusher.

JOHN R. GRAHAM,

IMPORTER AND DEALER IN

ROSEWOOD & MAHOGANY

AND ALL OTHER

FOREIGN AND DOMESTIC

CABINET WOODS,

SUITABLE FOR CAR WORK.

Cor. 11th Ave. and 30th St.

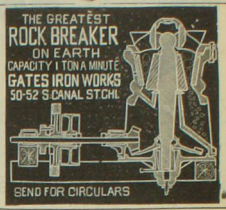
NEW YORK.

THE GREATEST ROCK BREAKER ON EARTH

CAPACITY 1 TON A MINUTE.

GATES IRON WORKS

50-52 S. CANAL ST. CHI.



SEND FOR CIRCULARS

## GILBERT CAR MANUFACTURING COMPANY, TROY, N. Y.

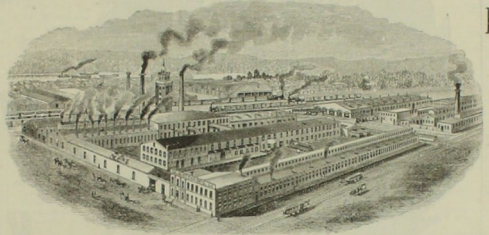
URI GILBERT, Prest. and Treas. EDWARD G. GILBERT, Vice Prest. and Asst. Treasurer WM. E. GILBERT, Secretary. DAVID HOIT, Superintendent.

MANUFACTURERS OF

ALL KINDS AND SIZES OF

Steam and Street

RAILWAY CARS.



Building, Dissecting and Packing Cars for Export a Specialty.

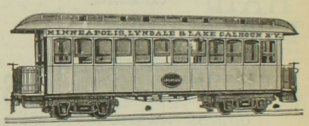
—ESTABLISHED 1820.— —INCORPORATED 1879.—

## J. G. BRILL & CO.,

PHILADELPHIA

BUILDERS OF

RAILWAY AND TRAMWAY CARS.




## PENINSULAR CAR WORKS,

DETROIT, MICH

Operating Car Works at Detroit & Adrian, Mich., and Detroit Steam Forge.

**Freight Cars of every Description.** **Wheels and Castings, Hammered Iron Axles.**

A. HEGEWISCH, President. THOS. F. B. Parker, Secy. { New York, N. Y.

C. BENN, Treasurer. W. H. CHADDOCK, Genl. Agt., { Chicago, Ill.

## THE UNITED STATES ROLLING STOCK COMPANY,

General Offices, 35 Broadway, N. Y.; Works, Chicago, Ill., and Urbana, Ohio,

Offers for lease to Railroads, Freight Lines, Mining Companies and others, Locomotive Engines, Box, Stock, Gondola, Dump, Flat and Refrigerator Cars,

And is Prepared to Build for LEASE and on Contract for CASH, or under the CAR-TRUST SYSTEM, such ROLLING STOCK as may be Required

## MICHIGAN CAR COMPANY,

JAMES McMILLAN, President.
HUGH McMILLAN, V. Pres. and Gen. Manager.
JAMES McGREGOR, General Superintendent.

MANUFACTURERS OF

RAILROAD FREIGHT CARS and "TIFFANY"

and all Other Successful Beef and Dairy Cars.

H. W. DYAR, Assistant Man.
W. K. ANDERSON Treasurer.
JOSEPH TAYLOR, Secretary.

Office: Newberry & McMillan Building, Detroit, Mich.

## DETROIT CAR WHEEL COMPANY,

Manufacturers of

LOCOMOTIVE AND CAR WHEELS. RAILROAD AND OTHER CASTINGS,

DETROIT, MICH.

JAMES McMILLAN, President
HUGH McMILLAN, V. Pres. and Gen. Manager.

J. H. WHITING, Superintendent.
W. K. ANDERSON, Secretary and Trea

## BAUGH STEAM FORGE COMPANY,

Manufacturers of all Descriptions of

CAR AND DRIVING AXLES, COUPLING LINKS AND PINS, SHAFTINGS, DRAW BARS ETC.

Works on River Road, Below City,

DETROIT, MICH.

JAMES McMILLAN, President.
HUGH McMILLAN, V. President.
JOHN B. BAUGH, General Manager.

SAMUEL A. BAUGH, Superintendent.
W. K. ANDERSON, Treasurer.
R. D. FIELD, Secretary.

## DETROIT IRON FURNACE COMPANY.

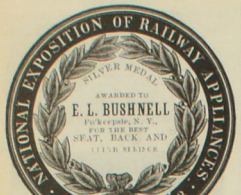
LAKE SUPERIOR CHARCOAL PIG IRON,

FOR CAR-WHEEL AND MALLEABLE USE.

DETROIT, MICH.

JAMES McMILLAN, President.
GH McMILLAN, Vice-Pres. and Treas.

LEE BURT, Manager.
E. C. WETMORE, Secretary.




Poughkeepsie, N. Y.
No. 320 Wabash Avenue, Chicago, Ill.
Patentee and manufacturer of Springs for Plain and Double Spring Edged Seats, Backs, Berths and Mattresses. The Only Springs Awarded a Prize at the National Exposition. Adopted and used by nearly all the leading railroads and car-builders in the United States and Canada. Also for beds throughout the country. Circulars, reference and samples free.

HOWARD IRON WORKS.
BUFFALO N. Y.,
MANUFACTURERS OF
Schlenker's Automatic Revolving Die Bolt Cutter and Nut Tapping Machine
ADAPTED SPECIALLY FOR RAILROAD USES

Important to Railroad Managers and Master Mechanics.
SIBLEY'S PERFECTION VALVE OIL.
More perfect lubrication insured, and entire freedom guaranteed from corrosion of cylinders and destruction of steam joints by fatty acids.
No exclusive use on 50 railroads
References and prices furnished upon application.
☞ Make exclusive specialty of the Manufacture of Valve and Signal Oils for Railroad use.
SIGNAL OIL WORKS,
FRANKLIN, PA.
J. C. SIBLEY, President.

STEEL RAIL BENDER
Steel Rail Benders
Track Drills, Track Jacks, Track Wrenches, Car Movers,
RAIL ROAD SUPPLIES.
E. P. DWIGHT,
407 Library St., - - Philadelphia, Pa.

ESTABLISHED 1865.
PEACE & CO.,
MANUFACTURERS OF
Wool Waste for Packing Car Boxes,
COTTON WASTE.
OFFICE, 983 NORTH FRONT STREET,
PHILADELPHIA.

JOHN S. LENG,
4 FLETCHER STREET,
NEW YORK,
SOLE AGENT FOR
LANSDELL'S PATENT
PORTABLE RAILWAY SYPHON,

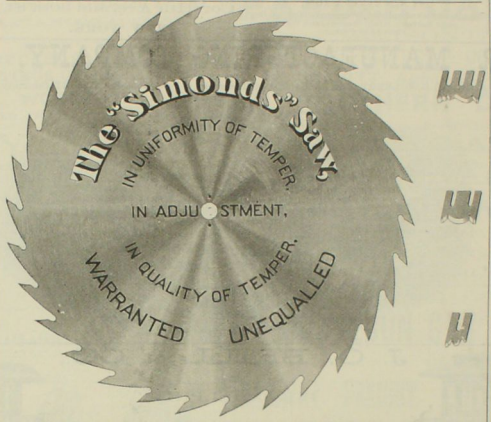
FOR SUPPLYING LOCOMOTIVE TENDERS FROM ANY BODY OF WATER WITHIN REACH.
WELDLESS STEEL TUBES,
SMOOTH INSIDE AND OUT.

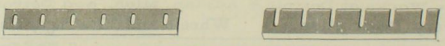
THIS HAMMER
AWARDED THE FIRST PREMIUM OF A SILVER MEDAL AT THE American Institute Fair, N. Y. CITY, NOV., 1875

Superior in every point to any modification of the Trip Hammer. Simple, Powerful, efficient and Cheap. Four sizes now being built. For Prices and Descriptive Circulars, address the manufacturers,
S. C. FORSAITH & CO.,
Manchester, N. H.,
who are also builders of the Abbe Bolt-Heading Machine.

VANDERBILT & HOPKINS,
RAILROAD TIES, CAR AND RAILROAD LUMBER, WHITE AND YELLOW PINE OAK, GUM AND CYPRESS.
No. 120 Liberty St., N. Y.
Boards, Plank and Dimension Lumber Sawed to Order
Creosoted Lumber, Ties and Piles to Order.

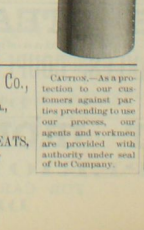
J. W. KREPPS.
V. A. KREPPS.
C. C. KREPPS.
KREPPS BROTHERS
INVESTMENTS,
PROMOTERS & BROKERS.
DUNCAN BUILDING, No. 11 PINE ST., NEW YORK.
*Make a specialty of introducing MERITORIOUS inventions DIRECT to Railway Companies. Organizing Stock Cos. for the Mfg. of Ry. Appliances. "Bonds and other securities negotiated."*
CORRESPONDENCE SOLICITED.



SIMONDS MANUFACTURING CO.,
Fitchburg, Chicago
ALL GOODS OF OUR MAKE FULLY WARRANTED.
CIRCULAR SAWS, CRESCENT-GROUND CROSS-CUT SAWS.
MACHINE KNIVES OF EVERY DESCRIPTION MADE TO PATTERN FURNISHED.


DRAWING PAPERS, DRAWING BOARDS.
TRACING CLOTH, TRACING PAPER, DRAWING MATERIALS
OF EVERY DESCRIPTION FOR DRAUGHTSMEN AND ENGINEERS.
PROFILE PAPERS, CROSS SECTION PAPERS.
DRAUGHTING SCALES, STEEL STRAIGHT EDGES FOR DRAUGHTSMEN.
SEND FOR A CATALOGUE.
OSWALD McALLISTER,
Successor to W. Y. McALLISTER,
PHILADELPHIA, PA.

BUFFALO PORTABLE FORGES,

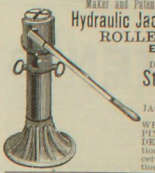
BLOWERS AND EXHAUST FANS.
ESPECIALLY ADAPTED FOR RAILROAD WORK.
MORE DURABLE, ECONOMICAL AND ALWAYS RELIABLE.

BUFFALO FORGE CO., BUFFALO, N.Y.

This process removes all grease and dirt, adds to and restores the colors, destroys all vermin, and leaves the plush as good as new, without removing the seats or upholstery, and detaining the car but 24 h. Warranted durable.

The U. S. Car-Seat Renovating Co.,
318 North Sixth St., Philadelphia, Pa.,
Protected by Patents.
FOR RESTORING COLORS TO CAR SEATS,
Indorsed by the leading R. R. companies of the country.

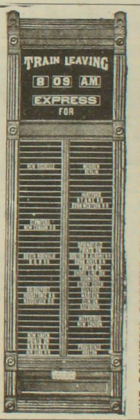
CAUTION.—As a protection to our customers against parties pretending to use our process, our agents and workmen are provided with authority under seal of the Company.

CAR SEATS.
GEORGE BUNTIN & CO.,
SOLE MANUFACTURERS OF
Buntin's Patent Car Seats,
AND NICKEL PLATED ARM CAPS, IN USE ON RAILROADS GENERALLY
No. 1,042 Ridge Ave., Philadelphia.

RICHARD DUDGEON,
No. 24 Columbia St., New York.
Maker and Patentee of IMPROVED
Hydraulic Jacks, Punches
ROLLER-TUBE EXPANDERS,
AND
DIRECT ACTING
Steam Hammers.

JACKS FOR PRESSING ON CAR-WHEELS OR CRANK PINS MADE TO ORDER. Communications by letter will receive prompt attention.

THE LOCOMOTIVE CYLINDER OIL CO.,
MANUFACTURERS OF
Railroad Valve Oil.

Contracts made for specified quantities, deliverable as required, at any depot in the United States or Canada.
Samples for trial, etc., will be cheerfully furnished on application to
D. A. STUART & CO.,
*Agents Wanted.* Chicago, Ill.



THE BOYNTON PATENT MAGIC STATION TRAIN DIRECTORY.
In use by the Penn. R. R. at Philadelphia, the N. Y. N. H. & H. R. R. at New York and New Haven, and the N. Y., W. S. & B. R. R. at Jersey City.
—SEND FOR INFORMATION AND CIRCULAR TO—
WHEELER & WILSON MANUFACTURING CO.,
BRIDGEPORT, CONN.

AXLE LATHES.
GEO. A. OHL & CO.,
NEWARK, N. J.
BUILDERS OF
FIRST-CLASS, HEAVY, DOUBLE AND TREBLE-GEARED
ENGINE LATHES,
FOR RAILWAY SHOPS, ROLLING MILLS AND MACHINE SHOPS.

As a filling for floors of passenger cars, this material prevents the loss of heat, deadens the sound and lowers the center of gravity of the car. More effective than shavings of double the thickness, and entirely fireproof Valuable also for covering all heated surfaces. Only $6 per 100 sq. feet, filling 3 inches thick. Sample and circular free by mail.

**U. S. Mineral Wool Co.,**
22 CORTLANDT ST., NEW YORK.

# Index to Advertisements in the National Car-Builder.

PAGE.

**Air Brakes:**
Eames Vacuum Air Brake Co., Watertown, N. Y. ..... xvii
The American Brake Co., St. Louis, Mo. ..(cover) 1
Westinghouse Air Brake Co., Pittsburgh, Pa. ..(cover) i

**Axles:**
Baugh Steam Forge Co., Detroit, Mich... ..... xi
Lang, W. Bally, New York and Boston, ..... vii
Midvale Steel Co., Philadelphia, Pa. ..... vii
New Albany Steam Forge, New Albany, Ind., ..... iv
Patent Shaft & Axletree Co., ..(cover) 4
Pittsburgh Forge & Iron Co., Pittsburgh, Pa. ..... i
Wilson, Walker & Co.(Limited), Pittsburgh, Pa. ..(cover) 2

**Bell Cord and Couplings:**
Wellington, Henry W., Boston, M ass. ..... iv

**Belt Holder:**
Stanley, W. R., Wellington, O ..... ii

**Boilers:**
Babcock & Wilcox, New York, N. Y. ..... xxvi

**Boiler Plate:**
Ewald Iron Co., St. Louis, Mo. ..... xviii

**Boiler Scale Remedy:**
Lord, Geo. W., Philadelphia, Pa ..... viii

**Boiltless Rail Joint:**
Gibbon Boltless Rail Joint Co., Albany, N. Y.. iv

**Bolt Cutters:**
Howard Iron Works, Buffalo, N. Y. ..... xii

**Brass and Copper Tubing:**
Ansonia Brass & Copper Co., New York, N.Y. xvii
Besley, Chas. H. & Co., Chicago, Ill. ...(cover) 4

**Cars:**
Billmeyer & Small Co., York, Pa. ..... x
Bradley Car Co., Worcester, Mass. ..... x
Brill, J. G. & Co., Philadelphia, Pa. ..... xi
Carlisle Mfg. Co., Carlisle, Pa. ..... vii
Dauphin Car Works, Duphin, Pa. ..... x
Essign Manufacturing Co., Huntington, W.Va. x
Erie Car Works (Limited), Erie, Pa. ..... x
Gilbert Car Mfg. Co., Troy, N. Y. ..... xi
Harlan & Hollingsworth Co., Wilmington, Del. vii
Harrisburg Car Mfg. Co., Harrisburg, Pa. ..... x
Lafayette Car Works, Lafayette, Ind. ..... vii
Lehigh Car Mfg. Co., Stemton, Pa. ..... x
Litchfield Car and Machine Co., Litchfield, Ill. iv
Loring, Harrison, Boston, Mass. ..... xi
Michigan Car Co., Detroit, Mich ..... x
Muskegon Car & Engine Co., Muskegon, Mich ix
North Carolina Car Co., Raleigh, N. C. ..... xi
N. W. Mfg. & Car Co., Stillwater, Minn. ..... vii
Pardee Car Works (Limited), Paterson, N. J. ..... x
Peninsular Car Works, Detroit, Mich. ..... x
Pennock Bros., Minerva, Ohio. ..... x
Southern Car Works, Knoxville, Tenn. ..... x
Stephenson, The John Co. (Limited), New York, N. Y. ..... ix
St. Charles Car Co., St. Charles, Mo. ..... xi
St. Louis Rolling Stock Co., New York, N. Y. xi
U. S. Rolling Stock Co., New York, N. Y. ..... x
Wason Car & Foundry Co., Chattanooga Tenn. x
Wason Manufacturing Co., Springfield, Mass. vii

**Car Brake Shoes:**
The Banning Brake Shoe Co., New York ..... iii
Congdon Brake Shoe Co., Chicago, Ill. ..... x
Standard Manufacturing Co., Ft. Wayne, Ind. vi

**Car Couplings:**
Cowell Platform & Coupling Co., Cleveland, O. xviii
McConway, Torley & Co., Pittsburgh, Pa. ..... ix

**Car Hardware:**
Post & Co., Cincinnati, O. ..... xxvi

**Car Pushers:**
Penfield Blind Co., Lockport, N. Y. ..(cover) 2

**Car Roofing:**
Granite Roofing Co., Philadelphia, Pa ..... ii
Taylor, N. & O. Co., Philadelphia, Pa. ..... xxii

**Car Seats:**
Buntin, Geo. & Co., Philadelphia, Pa. ..... xii
Hale & Kilburn Mfg. Co., Philadelphia, Pa. ..... xiii
Roberts, Henry, Hartford, Conn. ..... ii
Wakefield Rattan Co., Boston, Mass. ..... ii

**Car Seat Springs:**
Bushnell, E. L., Poughkeepsie, N. Y. ..... xii

**Car Seat Renovators:**
Car Seat Renovating Co., Philadelphia, Pa. ..... xii

**Car Springs:**
Andrews & Clooney, New York, N. Y. ..(cover)
Cliff & Richter Co., New York, N. Y. ..(cover)
Diamond State Car Spring Works, Wilmington, Del. ..... 3
Detroit Car Spring Co. Detroit, Mich. ..(cover)
French, A. & Co., "Elliptic," Pittsburgh, Pa. 2
French Spiral Spring Co., Pittsburgh, Pa. ..(cover)
Jeffries, J. & Son, Philadelphia, Pa. ..(cover)
National Car Spring Co., ..(cover 1) and page xx
Pickering, C. W. & Co., Philadelphia, Pa.(cover) 3
Scott, Chas, Philadelphia, Pa. ..... (cover) 3

**Car Trucks:**
Thielsen Truck Co., Chicago, Ill. ..... v

**Car Wheels:**
Allen Paper Car Wheel Co., New York, N. Y. .. viii
Andrews & Clooney, New York, N. Y. ..(cover)
Atwood Hemp Car Wheel Co., New York, N. Y. ..
Base Foundry & Machine Works, Ft. Wayne, Ind. ix
Bowler & Co., Cleveland, O. ..... xxiv
Caruta Wheel & Foundry Co., Waverly, N. Y. .. vi
Davenport, Fairbairn & Co., Erie, Pa ..... x
Detroit Car Wheel Co., Detroit, Mich ..... xi
Ellis, W. R., New York & Boston. ..... (cover) 4
Ensign Manufacturing Co., Huntington, W. Va. x
Erwa Mfg. Co., Berwick, Pa. ..... (cover) 4
Griffin Car Wheel Co., Detroit, Mich. ..(cover) 4
Griffin, Thomas F. & Sons, Buffalo, N. Y. (cover) 4
Griffin & Wells Foundry Co., Chi. Ill. ..... 4
Jersey City Wheel, Foundry and Machine Works, Jersey City N. J. ..... vii
Knoxville Car Wheel Co., Knoxville, Tenn. .. x
Lehigh Car, Wh & Axle Wks, Catasauqua, Pa. xi
Lobdell Car-Wheel Co., Wilmington, Del. ..... ix
Maher & Brayton, Cleveland, O. ..... vii
Mowry Car Wheel Works, Cincinnati, O. ..... vii
Paige Car Wheel Co., Cleveland, Ohio. ..... vii
Ramapo Wheel & Foundry Co., Ramapo, N. Y. ix
Taylor Iron Works, High Bridge, N. J. ..... vii
Thacher & Co., Geo. H., Albany, N. Y. ..... vii
Thomas Steel Tired Wheel Co., Jersey City, N. J. ..... viii
Union Foundry & Pullman Car Wheel Works, Chicago, Ill. ..... vii
Wason Manufacturing Co., Springfield, Mass. vii
Whitney, A. & Sons. Philadelphia, Pa. ..... vii

**Car Window Balance:**
Gardner, O. K., Pittsburgh, Pa. ..... xv

**Car Window Fastener:**
New York Car Fittings Co., New York ..... xv

**Chains:**
Box, Alfred & Co., Philadelphia, Pa ..... vi

**Chocks:**
Horton, The E. & Son Co., Windsor Locks, Conn. vii

**Chilled Car Wheel Grinding:**
Chilled Car Wheel Grinding Co., Carson, Nev. viii
Union Car Wheel Tool Co., Chicago, Ill. ix & xxviii

**Cork:**
Armstrong, Bro. & Co., Pittsburgh, Pa. (cover) 1

**Corrugated Sheet Iron:**
Cincinnati Corrugating Co., Cincinnati, O. ..... xvii

**Cupola:**
Colman Furnace Co., Detroit, Mich. ..... v

**Desks:**
Cutler, A. & Son, Buffalo, N. Y. ..... (cover) 4

**Draughtsman's Materials:**
Keuffel & Esser, New York, N. Y. ..... (cover) 4
McAllister, Oswald, Philadelphia, Pa. ..... xii

**Draw-Bars:**
Pittsburgh Forge & Iron Co., Pittsburgh, Pa. i
Safford, J. R., Buffalo, N. Y. ..... xv
Wilson, Walker & Co., Pittsburgh, Pa. (limited) (cover) 2

**Drills:**
Gray, G. A., Jr. & Co., Cincinnati, O. ..... (cover) 3

**Drop Presses:**
Wilson, White & Co., Moline, Ill. ..... vi

**Emery Wheels:**
Union Stone Co., Boston, Mass. ..... iii

**Engines:**
Westinghouse Machine Co., Pittsburg, Pa. ..... (cover) 1

**Engraving:**
Demarest, A. & Son, New York, N. Y. ..... xxvi

**Excavators:**
Industrial Works, Bay City, Mich. ..... ii

**Exhaust Fan:**
Buffalo Forge Co., Buffalo, N. Y. ..... xxvi
Hoyed & Smith Mfg. Co., Detroit, Mich.(cover) 2

**Flexible Shafts:**
Stow Flexible Shaft Co. Limited, Phila., Pa. vi

**"For Sale"—Machines:**
Locomotives—L. S. & M. S. R. R., Cleveland, Ohio ..... xxvi
Place, Geo. W., Mach. Co., New York ..... ix

**Forges:**
Buffalo Forge Co., Buffalo, N. Y. ..... xii
Empire Portable Forge Co., Cohoes, N. Y. ..... x
Keystone Portable Forge Co., Philadelphia, Pa. xi

**Frogs & Crossings:**
Elliot, H. & H., East St. Louis, Ill. ..... ii
Union Switch & Signal Co., Pittsburgh, Pa. (cover)

**Hand-Car:**
Clark, Josiah M., Howell, Mich. ..... x
Sheffield Velocipede, Peabody, H. W., & Co., Boston, Mass. ..... xxvi

**Hand Screws:**
Bevo Manufacturing Co., Detroit, Mich ..... ii

**Hoisting Engines and Boilers:**
Lidgerwood Mfg. Co., New York, N. Y. ..... v

**Hydraulic Jacks:**
Dudgeon, R., New York, N. Y. ..... xii
Janney, Philip S. & Co., Philadelphia, Pa. ..... xiv

**Injectors:**
Nathan Mfg. Co., New York, N. Y. ..... vi
Sellers, Wm. & Co., Philadelphia, Pa. ..... vi

**Interlocking Switches:**
Union Switch & Signal Co., Pittsburgh, Pa.(cov.) 1

**Investments:**
Kreppa Bros., New York, N. Y. ..... xii

**Journal Bearings:**
Ajax Metal Co., Philadelphia, Pa. ..... xxvi
American Bronze Works, Cleveland, Ohio. ..... xxvi
Damascus Bronze Co., Pittsburg, Pa. ..... xxvi
Fitzsimmons, J., Pittsburgh, Pa. ..... xvii
Fulton Iron & Engine Works, Detroit, Mich. ..... xvii
Hopkins, D. A., 113 Liberty st., New York, N. Y. ..... xx
Leroy Journal Bearing Co., New York ..... xxii
Lewis & Alliaston, N. W. Troy, N. Y. ..... xxv
Memeely, George Co., New York ..... xxvi
Phosphor-Bronze Smelting Co. (Limited), Philadelphia, Pa. ..... x
Ryan, J. J. & Co., Chicago, Ill. ..... xxvi
Thayer, F. W. & Co., Milwaukee, Wis. ..... x

**Journal Box:**
Ramapo Wheel & Foundry Co., Ramapo, N. Y. v

**Journal Box Lids:**
Hewitt Box Lid Cover Co., Chicago, Ill. (cover) 3

**Leather:**
Johnson, Thos. H., New York, N. Y. ..... iv
Vandell, G. R. & Co., New York, N. Y. ..(cover) i

**Lighting Cars:**
Pintsch Lighting Co., New York, N. Y. ..... iv

**Lime Extracting Heater and Filter:**
Stilwell & Bierce Mfg. Co., Layton, Ohio. ..... ii

**Linseed Oil:**
Dean, J. A. & Co., New York, N. Y. ..... xx

**Locomotives:**
Baldwin Loco. Works, Philadelphia, Pa. ..... xvi
Brooks Loco. Works, Dunkirk, N. Y. ..... xvi
Dickson Manuf'g Co., Scranton, Penn ..... xvi
Hinkley Locomotive Co., Boston, Mass. ..... xvi
Pittsburgh Loco. & Car Wks., Pittsburgh, Pa. xvi
Porter, H. K. & Co., Pittsburgh, Pa. ..... xvi
Rhode Island Loco. Wks., Providence, R. I. ..... xvi
Rogers Loco. & Mach. Wks., Paterson, N. J. ... xvi
Schenectady Locomotive Works, N. Y. ..... xvi

**Locomotive Ash Pan:**
Newth, W. H. D., Detroit, Mich. ..... xvii

**Lubricators:**
Barth-L.A. Fuhr, New York, N. Y. ..... v
Detroit Lubricator Co., Detroit, Mich. ..... xxii
Leipold & Co., Philadelphia, Pa. ..... iv
Lonergan, J. E. & Co., Philadelphia, Pa. ..... xxii
Nathan Mfg. Co., Elmira, N. Y. ..... vi

**Lubricants:**
Noyes Mfg. Co., Boston, Mass. ..... xxvii
Smith, E. A. & Co., Pittsburgh, Pa ..... vi
Urquhart, John S., New York, N. Y. ..... v

**Lumber:**
Perry, H. H. & Co., Toledo, Ohio ..... x
Vanderbilt & Hopkins, New York, N. Y. ..... xii

**Lumber Dryer:**
Curran & Wolff, Chicago, Ill. ..... iii

**Machine Knives:**
Simonds Mfg. Co., Fitchburg, Mass. ..... xii
Stevens, L. & I. J., Buffalo, N. Y. ..... xvii

**Machinists Tools:**
Bement, Miles & Son, Philadelphia, Pa. ..... vi
Betts Machine Co., Wilmington, Del. ..... vi
Bickford, E., Cincinnati, Ohio. ..... iv
Box, Alfred & Co., Philadelphia, Pa ..... vi
Davis, W. F., N. Bloomfield, N. Y. ..... (cover) 4
Flanders, P. B., Machine Works (Pedrick & Ayer), Philadelphia, Pa. ..... xxvii
Forsaith, S. E. & Co., Manchester, N. H. ..... xxvii
Fross Mfg. Co., Berwick, Pa ..... (cover) 4
Gray, Geo. A., Jr. & Co., Cincinnati, O. (cover) 3
Hilles & Jones, Wilmington, Del. ..... vi
Machine Tool Works, Philadelphia, Pa. (cover) 4
Niles Tool Works Co., Hamilton, O. ..... xvi
Pond, George A. & Co., Newark, N. J. ..... xvi
Pancoast & Maule, Philadelphia, Pa. ..... (cover) ix
Schaffer & Budenberg, New York, N. Y. ..... ix
Sellers, Wm. & Co., Philadelphia, Pa. ..... ii
Shimer, Samuel J., Philadelphia, Pa. ..... iv
Stow Flex. Shaft Co. (limited), Phila. Pa. ..... vi

**Mahogany, Fancy Woods & Veneers:**
Allen Co., F. C., Cincinnati, O. ..... xviii
Graham, John R., New York, N. Y. ..... xx
Palmer, Edward, Boston, Mass. ..... (cover) 4
Read, Geo. W. & Co., 180 Lewis st., New York. xx
Slucer & Goodrich Lumber Co., New York, N. Y. ..... (cover) 2
Upiegrove, Wm. E. & Bro., New York, N. Y. ..... xx

**Malleable Iron Castings:**
Dayton Malleable Iron Co., Dayton, Ohio ..... xv

**Matcher Heads:**
Whitney, Samuel S., Milton, Pa. ..... ii

**Nuts:**
Ohio Tool Co., Providence, R. I. ..... ii

**Oils:**
Galena Oil Works (Limited), Franklin, Pa. ..... xxvi
Signal Oil Works, Franklin, Pa. ..... xii
Stuart, D. A. & Co., Chicago, Ill ..... xii

**Oil-Box Lids:**
Vulcanized Fibre Co., Wilmington, Del. ..... iv

**Paints:**
Billings, Taylor & Co., Cleveland, O. ..... xv
Devoe, F. W. & Co., New York, N. Y. ..... ix
Iron Clad Paint Co., Cleveland, O. ..... 2
Jennings, H. W. Mfg. Co., New York, N.Y.(cover) 2
Tiemann, D. & Co., New York, N. Y. ..... xx
Tin Enamel Paint & Mfg. Co., New York, N. Y. xx
Masury, John W. & Son, New York, N. Y. ..... xx
National Paint Works, Philadelphia, Pa.(cover) 3

**Paint Remover:**
Bell & Henry, Fatteville, Wis. ..... xvii

**Pipe:**
Detroit Iron Furnace Co., Detroit, Mich. ..... xxi

**Platform and Coupling:**
Cowell Platform Coupling Co., Cleveland, O. .. xviii

**Portable Drills:**
Detroit Portable Co (Limited), Phila., Pa. ..... vi

**Portable R. R. Syphon:**
Long, John S., New York, N. Y. ..... xii

**Power Hammers:**
Bradley & Co., Syracuse, N. Y. ..... xvi
Forsaith, S. C. & Co., Manchester, N. H. ..... xvi
Long & Allstatter Co., Hamilton, O. ..... ii
Merrill Bros., Brooklyn, E. D. ..... vi
Williams, White & Co., Moline, Ill. ..... vi

**Power Punches, Shears and Hammers:**
Hilles & Jones, Wilmington, Del. ..... xxvi
Hilton, Dan & Co., Cincinnati, O. ..... xxvi
Hilles & Jones, Wilmington, Del. ..... ix
Long & Allstatter Co., Hamilton, O. ..... vi
Williams, White & Co., Moline, Ill. ..... vi

**Pumps:**
Hooker & Colville Steam Pump Co., St. Louis, Mo. ..... vi
McGowan, John H. Co., Cincinnati, O. ..... iv
Rumsey & Co., Seneca Falls, N. Y. ..... v

**Railways:**
Ft. Co. C. & I. R. R. ..... xv

**Railway Supplies:**
Cochonower, Geo. F. & Co., Boston, Mass.(cover) 4
Dwight, E. P., Philadelphia, Pa. ..... (cover) 4
Ellis, W. R., New York and Boston ..... (cover) 4
Fairbanks & Co., Lock Co., New York ..... ix & xxii
Fairbanks & Co., Philadelphia, Pa. ..... xvii
Lloyd & Lindsay, Philadelphia, Pa. ..... (cover) i
C. E. James & Co., Chattanooga, Tenn (cover) i
Post & Co., Cincinnati, Ohio. ..... ii & xxvii
Williamson & Cassedy, Philadelphia, Pa. ..... xxvi

**Railway Car and Locomotive Forgings:**
Pittsburgh Forge & Iron Co., Pittsburgh, Pa. .. i
Wilson, Walker & Co., Pittsburgh, Pa. (limited) (cover) 2

**Railway Equipment:**
Patten, Jas. J., New York, N. Y. ..... (cover) v
Sellers, Morris & Co., Chicago, Ill. ..... v

**Railway Signals:**
Wharton, R. R. Switch Co., Philadelphia, Pa. ..... (cover) i

**Rock Breakers:**
Gates Iron Works, Chicago, Ill. ..... xi

**Roofing:**
Bernard Corrugating Co., Cincinnati, O. ..... xvi
Taylor, N. & G.Co., Philadelphia, Pa. ..... (cover) 2

**Safety-Nut:**
Atwood Safety Nut Co., Springfield, Mass ..... ix
Detroit Lock Co., Terre Haute, Ind. ..... xvi
Deeds-nut Lock Co., Louisville Ky. ..... xx

**Safety Valves:**
Ashton Valve Co., Boston, Mass. ..... xvi

**Saws:**
Simonds Mfg. Co., Fitchburg, Mass. ..... xii

**Scrap Iron Dealers:**
Weil, M., Chicago, Ill. ..... (cover) 4

**Sheet-Iron (Limited):**
Wood, W. D. & Co. (Limited), Pittsburgh, Pa. xvii

**Stay-Bolt Iron:**
Lang, W. B., New York, N. Y. ..... iv
Phillips, Nimick & Co., Pittsburgh, Pa. ..... xvii

**Spring Clips and Centers:**
Fleming, Sisum & Co., New York, N. Y. ..... iv
Whitman & Barnes, Syracuse, N. Y. ..... v

**Station Train Directory:**
Wheeler & Wilson, Bridgeport, Conn. ..... xii

**Steel:**
Chrome Steel Works, Brooklyn, N. Y. ..(cover) 3
Detroit Steel Works, Detroit, Mich. ..(cover) 3
Midvale Steel Co., Philadelphia, Pa. ..... vii
Standard Steel Works, Philadelphia, Pa. ..... x

**Steel Castings:**
Buffalo Steel Foundry Co., Buffalo, N. Y. ..... xxvii
Chester Steel Castings Co., Philadelphia, Pa. .. vi
Standard Steel Works, Philadelphia, Pa. ..... xxvi

**Steel Tires:**
Midvale Steel Co., Philadelphia, Pa. ..... vii
Standard Steel Works, Philadelphia, Pa. ..... x

**Switch Stands:**
Union Switch & Signal Co., Pittsburgh, Pa.(cover) 1

**Switches:**
Union Switch & Signal Co., Pittsburgh, Pa.(cover) 1

**Tackle Blocks, Trucks and Baggage Barrows:**
Penfield Block Co., Lockport, N. Y. ..... iv

**Taps and Dies:**
The Pratt & Whitney Co., Hartford, Conn. ..... xxvii

**Transfer Tables:**
Robinson, N. W., Chicago, Ill. ..... (cover) 3

**Trucks:**
Automatic Truck Works, Midland Park, N.J. (cov.) 3

**Twist Drills:**
Cleveland Twist Drill Co., Cleveland, Ohio. ..... ii
Morse Twist Drill and Machine Co., New Bedford Mass. ..... ii

**Varnishes:**
Babcock, Johnson & Co., Boston, Mass. ..... xiv
Berry Brothers, Detroit, Mich. ..... xxvii
Bigelow, Moses & Co., New York, N. Y. ..... xv
Billings, Taylor & Co., Cleveland, O. ..... xv
Brooks, Clarence & Co., New York ..(covers) 1 & 4
Devoe, F. W. & Co., New York, N. Y. ..... xiv
Gray Varnish Co., Akron, O. ..... (cover) xv
Masury, John W. & Son, New York, N. Y. ..... xiv
Parrott Varnish Co., Bridgeport, Conn ..(cover) 4
Shipman & Boles, Dayton, Ohio. ..... (cover) xv
Valentine & Co., New York, N. Y. ..... xv

**Vises:**
Eagle Anvil Works, Trenton, N. J. ..... iv

**Waste:**
National Ry Patent Waste Co., New York. ..... ii
Peace & Co., Philadelphia, Pa. ..... xxvi

**Weather Strips:**
Patent Metallic Weather Strip Co. ..... (cover) 1

**White Lead:**
The Jewett White Lead Co., New York, N. Y. .. xx
Lewis, J. T. & Bros., Philadelphia, Pa. ..... xxvi

**Wire Goods:**
Barnum, E. T., Wire and Iron Works, Detroit, Mich ..... xxvii

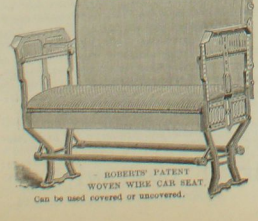
**Wrenches:**
Coes, L. & Co., Worcester, Mass. ..... xv

**Wood-Working Machinery:**
The Egan Co., Cincinnati, O. ..... ii
Fay, J. A. & Co., Cincinnati, O. ..... xxi
Forsaith, C. C. & Co., Manchester, N. H. ..... xxi
Goodell & Waters, Philadelphia, Pa. ..... iii
Rogers, S. C. & Co., Norwich, Conn. ..... vi
Sherby, Rugg & Richardson, Worcester, Mass. ..... (cover) 4

**Wrecking and Construction Cars:**
Harrison, Loring ..... iv

"ROBERTS' PATENT WOVEN WIRE CAR SEATS & SPRINGS."

CLEAN—DURABLE—ECONOMICAL—NOISELESS—LUXURIOUS—COMFORTABLE.


ROBERTS' PATENT WOVEN WIRE CAR SEAT

Can be used covered or uncovered.

The Cleanest Seat in use. The most Comfortable, Durable and Healthful seat in the market. The woven wire fabric forming a base for the seat and an open support for the Upholstery allows all the dust to sift out of the open bottom of the seat—none remains. On account of this open (meshwork) support the seat is free from dust, is vermin proof, cool in summer, warm in winter, at all times allowing free circulation of air through the seat, keeping it clean and wholesome. The seat requires less upholstery material to cover it than any in use, the labor thereon being also greatly lessened. Being entirely of metal, will last indefinitely long.

REQUIRES NO CANVASES, HENCE IS HIGHLY ECONOMICAL.

Adopted by Mich. Cent. R. R., Boston & Prov. R. R., C., C., C. & I. R. R., Conn. River R. R., N. Y., Ont. & West. R. R., Fort Wayne & Louisville R. R., Scioto Valley R. R., No. New Hampshire R. R., Old Colony R. R., Boston & Albany R. R., Boston & Maine R. R., Eastern R.R., Maine Central R. R., Boston & Lowell R. R., Housatonic R. R., Providence & Worcester R. R., etc., etc.

ADDRESS FOR PRICES, INFORMATION AND CATALOGUE,

HENRY ROBERTS, P. O. Box 363, Hartford, Conn.

# F. W. DEVOE & CO.,

Cor. Fulton and William Streets, MANUFACTURERS OF NEW YORK,

## DRY COLORS, COACH AND CAR COLORS IN OIL AND JAPAN.

Special Colors Compounded to Match any Desired Shade.

## FINE RAILWAY VARNISHES AND JAPANS FOR PASSENGER COACHES.

Also Freight Car, Caboo:e and Bridge Paints Ready for Use. Fine Brushes for Railroad Car and Coach Painting. All Kinds of Painters' Supplies and Artists' Materials. Mixed Paints—A Large Assortment of Desirable Shades for Inside and Outside Work.

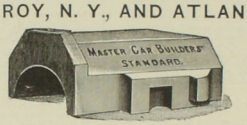
MANUFACTURERS OF RAILWAY CAR VARNISHES. **JOHN BABCOCK & Co** NO. 2 LIBERTY SQUARE. BOSTON, MASS.

# The MURPHY VARNISHES and A.V.B.C. System

## GEO. R. MENEELY & CO.,

WEST TROY, N. Y., AND ATLANTA, GA.,

GEO. R. MENEELY, T. W. GETMAN } West Troy, N. Y.




A. B. BOSTICK, Supt., "Atlanta Brass Foundry."

MANUFACTURERS OF

## HOPKINS' PATENT SELF-FITTING JOURNAL BEARINGS

FOR RAILWAY CARS AND ENGINES.

These bearings were awarded the **only** premium, a silver medal, at the National Exposition of Railway Appliances at Chicago in June, 1883. Patent pronounced valid by both Eastern and Western Railway Association. Bearings made of any required pattern, of different qualities of bronze, polished out on face, and finished with Hopkins' Patent Self-fitting Lining, which **speedily fits itself to any journal, new or old**, effectually obviating heating, and increasing the service more than 50 per cent. over unlined brasses. The most **reliable** and economical bearings in use. Adopted by the principal Railroads of the country for passenger and freight service. Old bearings taken in exchange. No charge for pattern making, packing or delivery. Price and Pattern Lists (of over 800 patterns) furnished upon application.

ESTABLISHED 1832. TRADE **VALENTINE'S VARNISHES** MARK. INCORPORATED 1882.

## THE GOLD MEDAL

Received by VALENTINE'S VARNISHES at the AMSTERDAM INTERNATIONAL EXHIBITION (September, 1883).

NEW YORK, CHICAGO, **VALENTINE & COMPANY,** BOSTON, PARIS.

RAILWAY VARNISHES. **MOSES BIGELOW & CO** EST. 1845 NEWARK, N.J.

## "RELIANCE" HYDRAULIC JACKS

Have been adopted by many leading Railroads as the best ever offered to the public. Made in three sizes: 15, 20 and 30 tons, to lift 12 in. or 18 in. SEND FOR CIRCULARS.

SOLID DRAWN

## Weldless Steel Tubes,

FOR

BUSHINGS, FERRULES, PUMP RODS, Etc.

MOST PERFECT ARTICLE EVER MADE.

IMPORTED TO ORDER ONLY.

## Philip S. Justice & Co.,

14 NORTH FIFTH STREET, PHILADELPHIA, PA.

## THE AJAX METAL COMPANY.

TRADE MARK.

*Having largely increased the capacity of our Foundry or Casting Department, and introduced all the new improvements in order to facilitate business, we are now prepared to fill orders for castings of every description with promptness and dispatch, made either of our "Ajax Metals" or of any Alloy our patrons desire, at the lowest rates a new first-class composition can be made. Our specialty is car brasses or Bearings bored to size, and coated with our Patent Adhesive Metal. To this Adhesive coating we invite special attention, as it proves to be what is desired for a solid brass bearing. We shall be pleased to submit sample brasses coated with this Metal to any Master Car-Builder or Master Mechanic that desires same.*

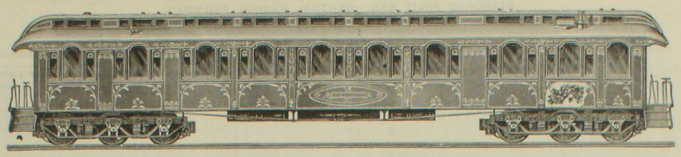
*We will make special prices in large lots to Locomotive and Car Builders. Correspondence solicited.*

J. G. HENDRICKSON, E. J. CLAMER, FRANK BUSHNELL, Co-partners.

THE AJAX METAL COMPANY,

14 North Fifth Street, Philadelphia, Pa

# THE NATIONAL CAR-BUILDER.



DEVOTED TO THE INTERESTS OF RAILWAY ROLLING STOCK.

VOLUME XV. NUMBER 6. | JUNE, 1884. | SINGLE NUMBERS, TEN CENTS. $1.00 PER ANNUM.


## Miscellaneous Items.

MR. CHARLES D' W. GIBSON has resigned the position of President of the Cliff & Righter Co. (Limited).

THE Lafayette Car Works, at Lafayette, Ind., are building 100 Tiffany summer and winter cars for the Commercial Express Fast Freight Line.

MR. A. C. ARMSTRONG, who has been the Purchasing Agent of the Michigan Southern & Lake Shore Railway for many years, has resigned the position. His successor is Mr. L. G. Higgins.

THE Defiance Brake Shoe Company, of East St. Louis, has been incorporated to manufacture and deal in Simonds' patent brake-shoe and other railway supplies; capital stock $100,000.

THE Chicago Refrigerator Car Campany has been incorporated to build and lease refrigerator cars; capital stock, $85,000; incorporators, C. R. Cummings, George A. Ives, B. F. Masten, C. E. Gore and Chas. F. Pierce.

MR. J. H. GOWAN, President of The Gowan Car Wheel Tool Co., has, we are informed, no official connection with the Chilled Car Weel Grinding Co., but is devoting his entire attention to the business of introducing the improved machines of the Gowan Car Wheel Tool Co.

THE Car Accountants' Association, at its annual convention, in Richmond, Va., May 20, elected the following fficers: President, W. A. Moody, Richmond & Danville; Vice-President, F. L. Luce, Chicago & Northwestern; Secretary, H. H. Lyon, Chicago & Alton; Treasurer, H. G. Sleight, Vandalia Line.

MR. EDWARD W. GRIEVES, Assistant Foreman and Draughtsman at the car works of the Harlan & Hollingsworth Co., Wilmington, Del., in whose employ he has been for sixteen years, has accepted the position of Acting Master Car-Builder at the shops of the Baltimore & Ohio Railroad, at Baltimore, Md.

THE Bass Foundry and Machine Works, Fort Wayne, Ind., and the Missouri Car & Foundry Company, of St. Louis, have contracted to furnish the Missouri Pacific system outside of Texas all the wheels it will require until April 1st, 1885. This will require a product by each concern of from 1,200 to 1,500 wheels per month.

THE Van Dusen Nut Lock, manufactured by the Peerless Manufacturing Co., of Louisville, Ky., is claimed to be the cheapest and most effective lock for preventing the loss of nuts from track bolts bridges, car tracks, switches, etc., that has yet been invented. It is made of the best quality of steel and can be used more than once.

A FIRE broke out in the shops of the New York & Harlem Railroad, at Tremont, on May 18, destroyed five shops with their contents, including two passenger and three freight cars. Spontaneous combustion, originating in cotton waste, is supposed to have been the cause. Most of the buildings were old, having been erected in 1854. The estimated loss is $200,000.

ORDERS have been issued to the employés of the New York & New England Railroad that all men whose work requires them to couple cars must use a coupling stick and that the company will not be liable for any accident when the stick is not used. The order and a stick are given to each employe, for both of which he is made to sign a receipt.

AT the shops of the C., C., C. & I. road at Cleveland, three new standard mogul locomotives are under construction, and will be completed during the Summer. They will have 18 x 24-inch cylinders, 56-inch driving wheels, and weigh 42 tons each. Last year the road built 15 new engines, but owing to the lighter traffic this year, any urther new construction will be unnecessary.

THE C., C., C. & I. road has established an "Engineers' Home" at Brightwood, Ind., containing sleeping and bath rooms, a fine dining room, library, and sundry minor conveniences, affording comfortable and attractive quarters for locomotive engineers of the line when off duty at that point. The General Manager of the road, Mr. E. B. Thomas, has furnished the library with several hundred books without cost to the company.

THE Cummer Engine Co., at Cleveland, O., have just completed an engine for the new shops of the Jeffersonville, Madison & Indianapolis road, at Indianapolis. The works have of late been running night and day. They are now building Ballentine ice and refrigerator machines. These machines use ammonia and have some very valuable features, and are built of sizes with a capacity for turning out from five to five hundred tons of ice per day.

THE Iron & Paper Car Company, which was incorporated in February last under the law of the State of New York, has been fully organized by the election of the following officers:—President, Wm. H. Paige; Vice-President, E. Prescott Barker; Treasurer, Chas. D' W. Gibson; Secretary, Wm. A. Birnie. Arrangements are in progress for building the cars, but the location of the works has not yet been announced.

IT is a well-known fact that color blindness is almost unknown among women. An Eastern paper suggests that one reason why they are so much superior to men in this respect is their habit of "matching" things. The utter imbecility of men in this business is generally admitted. The propriety of replacing our present locomotive engineers by females of keen and discriminating vision is suggested, thus avoiding the consequences of mistaking green for red signals, etc.

THE Red Star Line Steamship Vaderland recently brought to Philadelphia from Antwerp 13 car-loads of steel-tired car wheels manufactured at Essen, Germany, by the celebrated gun-maker, Krupp. The Krupp steel tires have been long in use in the United States, but not the entire wheels, which are different from those used here, having spokes and rims similar to a wagon wheel, but heavier in construction. The goods are in bond awaiting withdrawal by the owners.—*Iron Age.*

THE Atchison, Topeka & Santa Fe Railroad Co. is now applying the Westinghouse air brake to its freight cars, and has made arrangements by which the brakes can be put on 25 cars a day. A brick building at the Topeka shops is used for the storage of the brake fixtures, and adjoining this building a trestle track has been built, long enough to hold 30 cars. The cars are run upon this trestle while the work is done. At one end of the track are placed a boiler, air-pump and other apparatus for testing the brakes when fitted to the cars.

THE *Philadelphia Record* says that General Manager John E. Wootten, of the Philadelphia & Reading Railroad Company, who is the patentee of the Wootten dirt-burning locomotive, has sold his rights in the patent for a sum estimated between $250,000 and $300,000. The purchase was made by an association of railroad capitalists, who have formed a company, of which Mr. Joseph Wharton, president of the Wharton Switch Company, is the leading man. The purchasers will continue the manufacture of the locomotives under the title of the Wootten Locomotive Company.

ENGLISH railway rolling stock works are nearly all busy, and a large number of the orders are for iron framework for cars to be built abroad. A contract for 1,400 freight cars for the Western Railway of Buenos Ayres, is just new being executed by Messrs. Brown, Marshall & Co., of Birmingham. The whole of the frames are of wrought iron. Half the number are covered freight cars, and in these the frame-work is of angle and T iron of Staffordshire make. The firm is also executing another contract for South America for 230 covered freight cars, the frames of which are likewise of iron. In their passenger car department they have three other contracts on at present for cars with iron frames for shipment. This pattern of frame is becoming almost universally adopted for all foreign orders, and appears to be more suitable for hot climates than timber.—*The Engineer.*

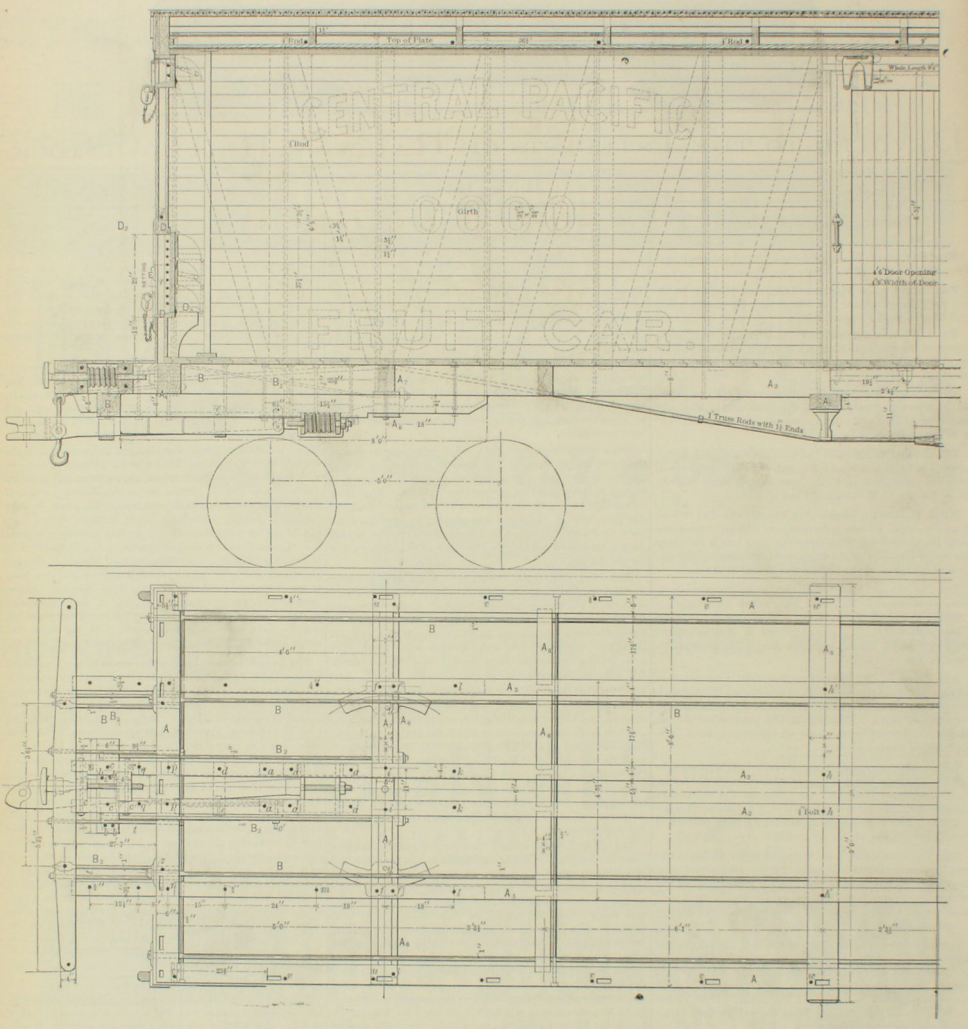
A VERY liberal quantity of satire has been bestowed upon the Mayor of Bangor, Me., because he vetoed the resolutions of the Common Council of that city providing for the adoption of standard railroad time, yet this Down-East city official is no more deserving of censure than are the people of certain towns out West who allow their mayors and councilmen to adopt the standard, while the entire local community persist in running their clocks and watches in accordance with local time. To do otherwise would forestall their appetites for dinner and shake confidence in the stability of the sun. It would seem that the people of such a big and progressive town as Cleveland ought to know that the ninety-meridian time is about as accurate as their so-called local time, which is right only four days in the year, and quite often at other times out of the way 20 minutes or more. Half the people in the world have yet to find out that their noon does not come as they suppose in the middle of the day, and that the orb of day is considerably more irregular than the general run of cheap watches.

AT the Meadville (Pa.) shops of the New York, Pennsylvania & Ohio road, Mr. Fuller, the General Master Mechanic, is building three mogul engines that will weigh about 45 tons each. They have 51-inch boilers, with 175 2-inch flues 11 feet long. The grates are 72 inches, the valves have 5¼ inch throw, ¾-inch outside and ¼ inside lap. When the six-foot gauge was changed to the standard, the engines were reduced to three classes, switching engines with tanks on the boilers, American engines, and moguls. The road has also in service some consolidation engines. The several classes all have interchangeable parts, so that cylinders, guides, cross-heads, rods, rockers, boxes, etc., can be put on indiscriminately. In the passenger service the engines have two sizes of cylinders, 17 x 24 and 18 x 24 inches, but both go on the same size of frames. The engines with the large cylinders weigh 42 tons, and can haul trains of from 12 to 15 cars over the heavy grades. At the close of last year the narrow-gauging of 135 wide-gauge engines was completed, and during the last three years 140 engines have been built and rebuilt. At the Kent (O.) shops a new standard passenger car is under construction.

THE French railway authorities are at present engaged in a series of experiments from which, perhaps, our own directors might take some hints. With hot weather coming on, or at least in the ordinary course of nature expected, the problem is how to keep the railway carriages cool. In France travelers are packed very tight, and most trains go very slowly, and the authorities have to arrange to deliver their human cargoes at distant termini with vitality not quite extinct. So they are now exercised in seeking how to cool their carriages. They have gone as far as India for suggestions, and the favorite experiment is with a kind of punkah. A long cylinder runs the length of the roof of the carriage, furnished with fans set in motion by revolving the cylinder. After many systems tried, this seems the most practicable, and the only point in dispute is how to get the motive force. The surplus steam of the engine has been tried on one line, and on another a little arrangement like a wind-mill attached to each carriage, the motion of the train causing the wings to revolve, while the occupants of each carriage can regulate or arrest the stream of air. Both systems are being tested, and our companies need only take the benefit of these experiments and adopt the most successful or the least costly.—*Pall Mall Gazette.*

THE Central Wharf Railroad Shops, Pensacola, Florida, have recently turned out the smallest locomotive ever made in the United States for regular service. It was designed by Mr. John Douglas, the master mechanic of the shops, and was built under his direction. The engine is for a 20-inch-gauge road. The cylinders are 5x8 inches; driving-wheels, 12 inches diameter; wheel base, 7 feet 9 inches. The boiler is 2 feet 8 inches diameter; 4 feet 3 inches greatest height above rail, and has 97 flues 1¼ diameter. The tank is made to carry 180 gallons of water, and the coal-bunkers have a capacity of 250 pounds. The whole machine is 9 feet 6 inches long, 4 feet 6 inches wide, and weighs, in working order, 3½ tons, is mounted upon two four-wheeled trucks, one being the driving truck, which is connected to an intermediate axle hung in the middle of the frame with a special bearing, so as to allow the driving truck to move around its centre to adjust itself to the irregularities of the road. This arrangement gives great freedom in passing the sharpest curves, and the long wheel base gives a steady motion to the engine on the track at a high rate of speed. The engine was set to work hauling construction material on the wharf, the track being very uneven, but it operates very satisfactorily. It pulls 15 loaded cars, weighing about 45 tons, and handles them easily. A pressure of 80 pounds is carried, and the valves are planed to cut off at ¾ strike.—*Industrial World*

## STANDARD FRUIT CAR—CENTRAL PACIFIC RAILROAD.



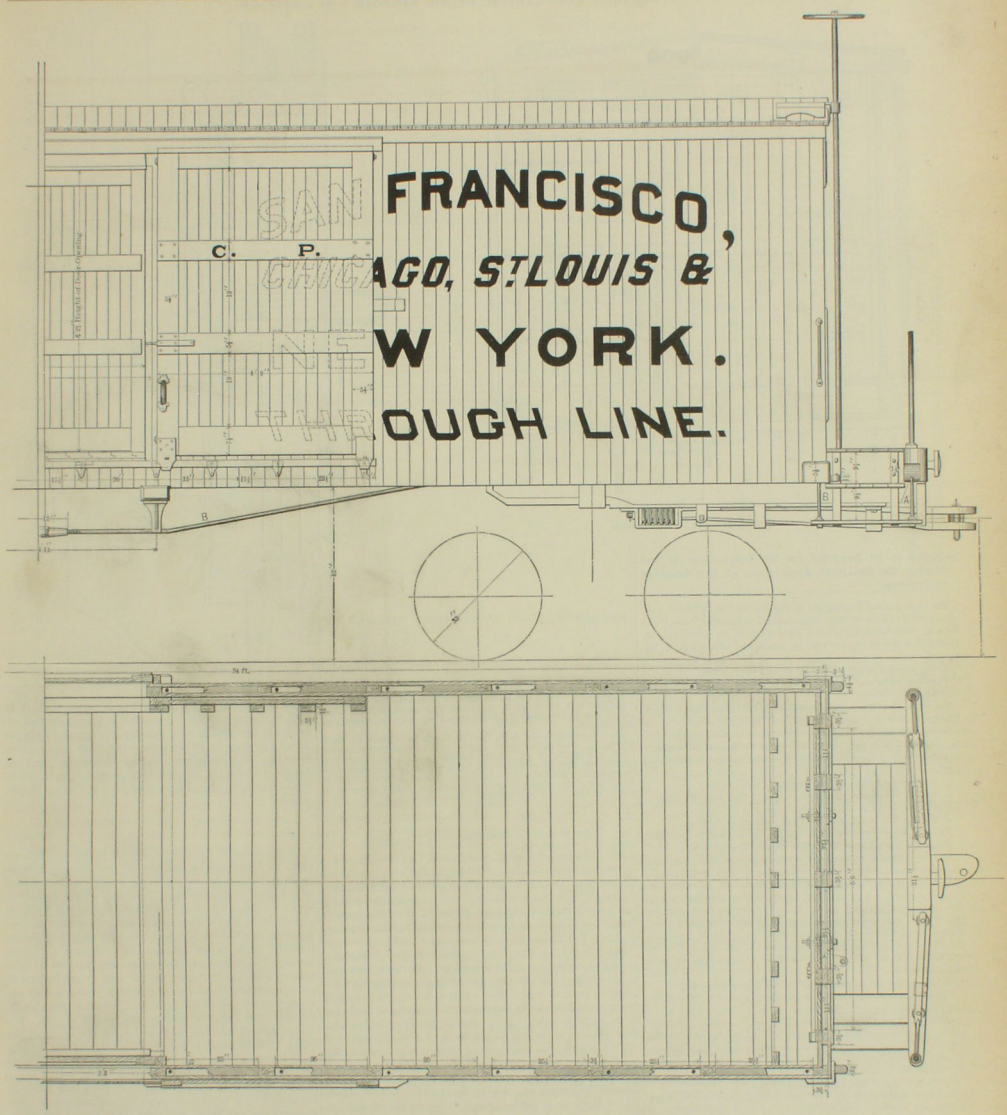

Longitudinal Section and Top View of Floor Frame.

DIMENSIONS OF TIMBERS.

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Side sills | 5 | × 8 | in. | × 33 ft. | 4 | in. |
| 2 Center sills | 4 | × 8 | " | × 33 " | 3 | " |
| 2 Intermediate sills | 4 | × 8 | " | × 33 " | 3 | " |
| 2 End sills | 6 | × 8 | " | × 8 " | 6 | " |
| 2 Plates | 2½ | × 4¾ | " | × 34 " | 0 | " |
| Tie planks | 4 | × 8 | " | × 9 " | 0 | " |
| 4 Draw timbers | 3½ | × 6 | " | × 8 " | 0 | " |
| 8 Platform sills | 3½ | × 8 | " | × 2 " | 0 | " |
| 2 Platform end timbers | 6 | × 8½ | " | × 8 " | 2½ | " |
| 4 Platform timbers | 3¾ | × 5 | " | × 9 " | 0 | " |
| 8 Cross pieces | 4 | × 8 | " | × 1 " | 8½ | " |
| 2 " " | 4 | × 8 | " | × | 8½ | " |
| 8 Truss blocks | 4 | × 6 | " | × 1 " | 5⅝ | " |
| 2 King-bolt blocks | 5 | × 5½ | " | × | 7 | " |
| 26 Body posts | 1¾ | × 3¾ | " | × 6 " | 8 | " |
| 4 Corner posts | 2⅝ | × 3⅝ | in. | × 6 ft. 8 | in. | |
| 4 Door posts | 2⅝ | × 3¾ | " | × 6 " 8 | " | |
| 10 Carlines | 1¾ | × 9⅛ | " | × 8 " | 2¾ | " |
| 2 End plates | 2⅝ | × 10 | " | × 8 " | 2¾ | " |
| 1 Ridge pole | 2⅝ | × 3½ | " | × 34 " | 0 | " |
| 2 Purlins | 1¾ | × 3¾ | " | × 34 " | 0 | " |
| 4 Side girths | 2⅝ | × 3¾ | " | × 14 " | 3¼ | " |
| 2 End girths | 2⅝ | × 3¾ | " | × 8 " | 2¾ | " |
| 2 Side door guides | 2⅝ | × 3¼ | " | × 9 " | 6 | " |
| 24 Side braces | 1¾ | × 3¾ | " | × 6 " | 10 | " |
| 8 End braces | 1¾ | × 3¾ | " | × 6 " | 10 | " |
| 2 Platform truss beams | 6 | × 6 | " | × 2 " | 1 | " |
| 4 Tread boards | 1¾ | × 8½ | " | × 2 " | 5 | " |
| 4 " " | 1¾ | × 8½ | " | × 1 " | 9 | " |
| 6 Ventilator boards | 1¼ | × 7¾ | " | × 6 " | 7½ | " |
| 2 " " | 1¼ | × 6¾ | " | × 6 " | 7½ | " |
| 18 Ventilator guard posts | 1¾ | × 3¾ | in. | × 6 ft. 9 | in. | |
| 8 Inside door guards | 1¾ | × 3¾ | " | × 6 " 9 | " | |
| 2 " " " | 1¾ | × 5 | " | × 6 " 9 | " | |

Flooring, 1¾ in. thick, 6 in. wide or less.
Roofing, ⅛ × 3½ in. double.
Siding, lining and ceiling, ⅛ × 3½ in.

These cars are 34 feet in length over the bodies, and are intended to be run in passenger trains. The floor frame is somewhat different from the usual construction. There are four truss rods *B B*, which run the whole length of the car. In addition to these, the platform is held up by the rods $B_3$ and $B_4$. The rods $B_4$ run from the bolster up over the end sill and down into the platform timber *B*. The bolster itself $A_4$ is of iron, but has over it a line of




Side Elevation and Floor.

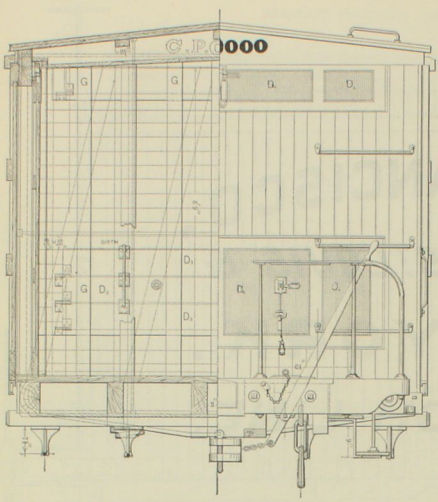
timber $A_3$ let in between the sills. Cross framing $A_4$ is mortised into the sills 3¼ feet back of the bolster. This, with the needle beams $A_5$, make the floor of the car very rigid. The side framing makes a very rigid truss, and as there are brace rods for each brace, the entire side of the car becomes a very rigid truss also. The bolts are shown in the longitudinal section as black dots, and in the original blue print the sizes of the bolts are indicated by letters, so that at a glance the size of bolt for any particular point can be seen in the plan. This method of drawing has great advantages, since small single letters can be much more easily read than a fractional figure, which is usually too small to be distinct.

After having secured the utmost strength and rigidity in the frame, the next thing to be looked after is the proper ventilation of the car body. This is effected by end ventilators, which are shown in their place in the longitudinal section and end elevation and also on an enlarged scale in the detached cut, which shows a section through the lower ventilator. The ventilator opening has a sill $D$, and a cap $D_2$ and is closed by three slats $D_3$. These are about 6½ feet long by 6¾ inches wide. In the engraving they are shown closed, but the dotted lines indicate their position when thrown inward and open. They are so constructed as to prevent the ingress of rain when shut, and give the full amount of opening when dropped inward by means of the latch $E$. To effect this, they are hinged in a somewhat peculiar manner by the hinges $F$. The bar $F_2$ is jointed to their upper edges, and when they are thrown back connects and holds them in place. A grating, $D_4$, is placed in front of them, and in front of that is the wire netting $D_4$. The lower openings, as will be seen, are much larger than the upper ones. Both, however, are divided into four panels. The hinges are placed at the ends of the slats, and the connecting links $F_2$ a short distance from their ends. The posts $G$ form a grating or protecting partition just inside of the slats, so that they have space in which to open without coming in contact with the load. Double-doors are provided, one of which, on the outside, is solid and of the usual pattern, while there is an open inside door which can be used in case of necessity. The posts $G$ which protect the ventilators stand back from the end of the car 9 inches in the clear. The upper opening is furnished with a single slat and two bars only. Its upper edge is on a level with the plate of the car. Both upper and lower ventilators are furnished with latches.

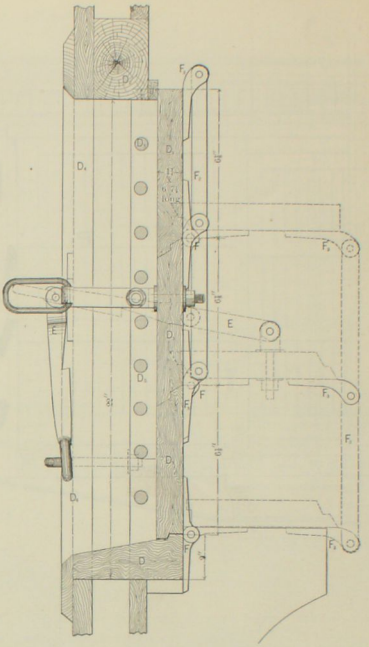
The ends of the car are like those of an ordinary passenger coach, so far as the platform goes, but have the usual grab-irons and ladders of a freight car, so it can be used either in freight or passenger trains and permit the brakes to be operated from the roof, if necessary, in the usual way, one end being provided with a brake-wheel for that purpose.

(*See next page.*)

STANDARD FRUIT CAR—CENTRAL PACIFIC RAILROAD. *(See preceding pages.)*



End Elevation and Section.



Enlarged Section through Lower Ventilator.

### Subjects to be Reported on by Committees of the Master Car-Builders' Association at the Saratoga Convention.

The next Annual Convention of the Master Car-Builders' Association will be held in Saratoga, beginning Tuesday, June 10, at 10 A.M. The following is a list of the subjects on which it is expected that special reports will be made, and which will be discussed.

1. On Sharp Flanges—Their Cause and Prevention.

The Committee on this subject was instructed as follows, at the last Annual Convention :

*Resolved*, That the recommendations of the Committee on Sharp Flanges be and is hereby adopted, and that the Committee be continued generally, and with full power to confer with officers in charge of the permanent way, and with general superintendents with reference to a uniform and proper form of rail head.

2. On Standard Freight and Passenger Car Trucks.

3. On Brake-Shoes, Brake-Beams, and the Interchangeable Parts of the Brake Arrangements of Cars.

4. Standard House-Car to Carry 60,000 lbs. of Lading.

The following resolution, defining the duties and work of this Committee, was adopted at the last Annual Convention :

*Resolved*, That a committee of seven be appointed, representing the largest car-owning roads which send members or representatives to the Master Car-Builders' Convention, said committee to confer together and, if possible, agree upon a standard house-car, with details of all parts, whose maximum load shall be 60,000 lbs., said committee to report to the Executive Committee, and the Executive Committee, when ready to report, to send a copy of the report to each member of the Association for examination ; the Executive Committee to report at the next annual meeting.

5 Standards and Appliances for the Safety of Trainmen.

This Committee was appointed in accordance with the following resolution :

*Resolved*, That a committee be appointed to prepare a circular calling attention of railroad managers to standards and the appliances for the safety of trainmen which have been recommended by this Association, and that this Committee be urged to do everything in their power to secure their adoption.

6. Piece-Work in Building Freight-Cars.

7. Plans for Car-Shops and the Arrangement of Car-Shop Machinery.

8. Freight-Car Framing and Trussing.

9. Passenger-Car Framing and Trussing.

### Car Couplers in Massachusetts.

The following law has been passed by the Massachusetts Legislature, and approved by the Governor :

SEC. 1. Every railroad company operating a railroad, or any portion of a railroad, wholly or partly within the State, shall place upon every freight car hereafter constructed or purchased by such corporation, and upon every freight car owned by such corporation of which the coupler or draw-bar is repaired by it, with intent to use such car, such forms or form of automatic or other safety coupler at each end thereof as the Board of Railroad Commissioners may prescribe after examination and test of the same, and the Railroad Commissioners may annul any recommendation made by them.

SEC. 2. The provisions of this act may be enforced by the Supreme Judicial Court on application of the Attorney-General.

SEC. 3. So much of this act as relates to the examination and test shall take effect on its passage, and the same shall take full effect on the first day of March next.

The following circular, dated Boston, May 15, has been issued by the Massachusetts Railroad Commission :

By an act of the Legislature, approved May 8, 1884, all new freight cars owned by Massachusetts railroad companies are, after March 1, 1885, to be equipped with automatic or other safety couplers, approved by this Board, after examination and test thereof.

The Commissioners will, on Sept. 25 next, hear at their office, No. 20 Beacon street, Boston, all parties desiring to set forth the merits of any safety coupler, and also any criticisms thereof by experts, and they will witness tests of such devices to be made in or near the city of Boston. The hearing will begin at 10 o'clock a. m. Records of the working of safety couplers in actual use for traffic are especially desirable."

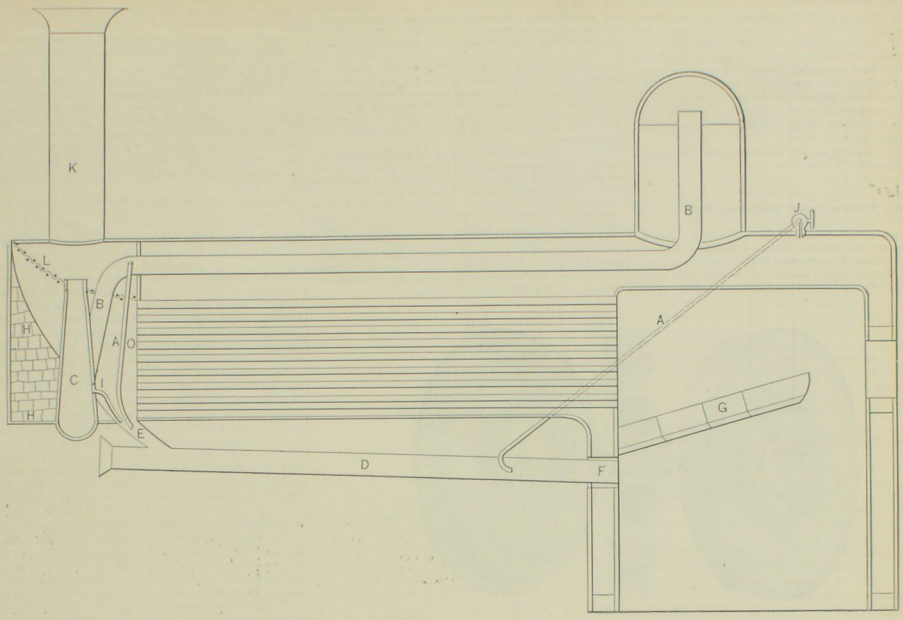
### New Woodruff Sleeping and Parlor Cars.

The Woodruff Sleeping and Parlor Car Company are having constructed, at the Jackson & Sharp Co.'s works, at Wilmington, Del., a number of new cars to run on Western roads. Two of the completed onns were exhibitsd early last month at the passenger depot of the Erie road in Jersey City, one or them being a sleeper for the Chicago, St. Louis & Pittsburgh, and the other a parlor car for the "three Cs & I." They are in every respect luxurious, beautiful and commodious structures. Like most new cars of their class, the ornamental features in their various details are exceedingly attractive, and can only be described in an imperfect way at the best. The interior of both cars is finished in solid, light colored Mexican mahogany. The sleeper is 60 feet long over the body, and has twelve berth sections of a little more than the usual length, which of course gives more space between the seats. The berth fronts are of rosewood, with pearl inlay of elaborate and highly ornamented design. Each bed contains an 18-pound hair mattress upon wire springs. The seats are upholstered in scarlet plush, and the seat-arms are of elaborate and beautiful design. The lower lights of the windows are 24 × 22, and the top ones 24 × 10 inches, and are provided with roller curtains. At one end of the car is a smoking room, gentlemen's toilet and closet, and at the other end a ladies' toilet, heater and porter's room. The parlor car is 56 feet in length over the body. In the central compartment are 18 pivoted, high-backed chairs, upholstered in scarlet plush. There are also five windows on each side, with lower lights of 46 × 23-inch glass, and upper ones of 46 × 12, all shaded with roller curtains. The ceiling is of decorated oak. The lighting is by silver-plated double-burner Hicks & Smith lamps. The clear-story lights are protected by wire gauze screens, also the end ventilators, so as to exclude dust and cinders.

Without referring specially to subordinate details, all of which are in keeping with the general design, it may be said that the decorative work in these cars is exceedingly rich and effective without betraying any attempt at mere display, or, in other words, to construct ornament. The material being rich in itself, shows for what it is, and needs no accessions to make it look better than it is. Both of them may well be regarded as among the best examples to be found in this counfry, or anywhere else, of railway progress in the department of passenger-car construction. The parlor car is named "Crestline" and the sleeper "Juniata." They are both mounted on six-wheel trucks, with 33-inch Paige wheels and French elliptic springs.

AT the shops of the Lake Shore & Michigan Southern road, at Cleveland, a number of the older passenger coaches of the company are being refitted and repainted so as to look as good as new. The style of the decorative finish, on the outside more particularly, is so well designed and effective, and corresponds so nearly in respect to color contrasts and the colors themselves with some suggestions recently made in our columns, as to deserve a passing notice. The bodies of the coaches are painted a light yellow, with a gold horse-chestnut leaf at the bottom of each panel, the whole forming a very pretty border extending the length of the car side. The corners are black, relieved with a vase of flowers and grasses in gold. The sprays extend upward, and nearly fill the space of the panel. The lettering is in gold, with a light-green shading upon a yellow ocher letter-board. The number is in large gold figures on a rectangular black shield which has a frame of gold with red line ornament, the whole being in the center of a large oval chocolate-colored panel. The door-casings are black and gold. The trucks are painted a bright red striped with black, a style almost exactly corresponding with the suggestion made by a writer in the April CAR-BUILDER. In respect to outside finish, these rejuvenated coaches are certainly very handsome, and the effect is due to a skillful choice and distribution of colors in connection with an artistic arrangement of the decorative details. As regards the wearing qualities of light and dark colors, a very fair test can be made by painting one or two panels black or very dark, and the rest light yellow, and then note their durability. There can be no doubt about the result. The yellow would win.

THE Atwood Safety Nut Company, by its treasurer, J. W. Labaree, gives notice to all whom it may concern that "any nut with any form of recess (or washer) in the lower face of the nut, in combination with one or more slats or cavities applied to a bolt, is a manifest infringement of the Atwood patent of October 11, 1875, No. 169,597, and any party who infringes said patent the company will hold responsible to the full extent of the law."




GRIGGS' LOCOMOTIVE SPARK CONSUMER.

The engraving illustrates a method devised by Mr. George H. Griggs, of Hornellsville, N. Y., for preventing the sparks in locomotives from escaping through the stack, and forcing them into the fire box to be consumed. Both live and exhaust steam are used for this purpose, but the main reliance is upon live steam. When this is used it is taken from the pipe *B* while the engine is working, and conveyed by pipe *A O* which supplies the jet for forcing the sparks down pipe *E* to *D* and thence to the fire box. Pipe *I*, connecting with exhaust pipe *C*, is intended for using the exhaust for forcing sparks into pipe *D* through which they are drawn by the vacuum in the fire-box. The pipe *A* conveys steam from cock *A* on top of boiler, and is intended for blowing out or cleaning the pipe at *F* in case it becomes clogged, and to force air into the furnace when engine is not working. *G* is the brick arch, *H H* brick work to form an incline to convey sparks to pipe *E*. Air can also be admitted at the flare end of pipe *D* to help combustion. The diameters of pipes are as follows: *D*, 4 in.; *F*, 4¼ in.; *E*, 3½ in.; *A O*, scant ¼ in. opening. The cost of fitting up a locomotive with this arrangement is about $75.

### A Parlor Car with Bay-Windows.

The *Railway World* contains the following description of a new parlor car, No. 901, recently finished at the Altoona shops of the Pennsylvania Railroad. The decorative and constructive designs applicable to the interior were furnished by Mr. Bruce Price, a distinguished architect of New York:

"The exterior of the car is painted the standard color, Tuscan red, and except in the variation produced by the external evidence of the bay-window arrangement, hereinafter described, it does not differ materially, in appearance, from the standard passenger cars of the company. An improvement has been made in the trucks, consisting mainly in an increase of about six inches in their length and the substitution of sets of four elliptic springs, for three heretofore used, which change does not involve an increase in the quantity of steel.

"The dimensions of the car are similar to those usually adopted, 62 ft. long and 9 ft. 10 in. wide. The number of seats furnished is 37, six of which are in a compartment so arranged that it can be wholly shut off from the main portion of the interior by the use of curtains, or only partially separated by a low wooden partition, analogous in effect to the frame-work which subdivides a church into pews; and ten seats are provided in the smoking-room, which is unusually large and entirely shut off from the other portions of the interior by wooden partitions reaching to the ceiling. The seats are of three kinds—fixed chairs, movable chairs, and sofas or lounges. The 21 seats in the main saloon or parlor embrace three seats on a sofa, four movable rattan chairs, and fourteen fixed or revolving chairs of peculiar construction. Instead of resting solely on a pivot placed beneath a point near the center, the pivot is attached near the front of the chair, and additional support is furnished by two hind legs. This arrangement avoids the uneasiness of the vibratory motion, and liability to sudden and involuntary changes of position, such as those arising from rapid movements of a train round a sharp curve. The fixed chair is a very easy one, and the ability of the person occupying it to make it revolve is not materially lessened, while additional comfort and steadiness are given by the supporting legs.

"The subdivisions of the available space of the interior are so arranged that the dimensions of the compartment, which contains a lounge or easy sofa and three movable rattan chairs, is 7 ft. 4 in. by 6 ft.; the smoking-room, which contains two sofas or lounges and four movable chairs, is 12 ft. 6 in. by 6 ft.; the hall adjacent to the compartment and smoking-room is three feet wide; the front of the car has on one side an unusually large ladies' toilet-room, it being 8 ft. 6 in. long, and about 3 ft. wide; and on the other side space is left for a Baker heater, washstand (of Tennessee marble), mirror, and a small baggage-room.

"The bay-window feature, which will attract much attention, is so arranged that there are five bay-windows on each side of the car. The divergence from a straight line is inward, instead of outward, and it makes little or no perceptible encroachment on available space. The width of each bay-window is 7 ft. 4 in. consisting of a central window 3 ft. wide, and two wings, deflecting slightly in opposite directions, which are each 2 ft. 2 in. wide. Above the top sill and below the lower sill, the exterior of the car presents the usual even or straight surface. The sides are rendered exceptionally strong by a peculiar arrangement of the posts supporting the windows, substituted for the ordinary panels, which act as a brace. While the portion of the sides of the car, which is on a level with, and for a short distance above, the upper part of the body of a seated passenger, consists of a series of windows, and their sashes, separated by relatively small posts, careful attention has been successfully given to a combination of great strength with the increase of light; and by the deflection of a large proportion of the glass used the extent of the view available to travelers has been enlarged in a marked degree, so that they can to an extent hitherto unattainable, dwell upon the charms of the scenery in front and behind the moving train, as well as directly opposite to the point passed at any given moment. Double sets of windows are provided. They can all be raised 20 inches, which is higher than usual. The bay-window feature is more noticeable on the inside of the car than on the outside, as it is only in the interior that the ingenious and effective mechanical or architectural devices and decorations by which it is accompanied, adorned and strengthened, can be observed.

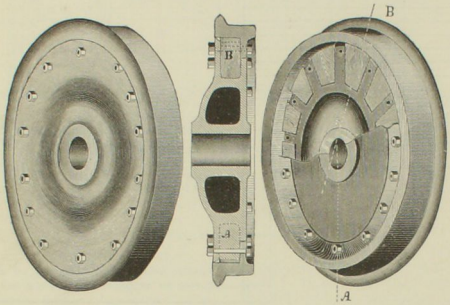
"To a considerable extent this attractive novelty has given direction to the style of interior finish and ornamentation. It may, perhaps, be most appropriately designated as rococo, a style prevalent in France during the first empire, and freely used in decorating palaces at Dresden. The general aspect presents about as marked a contrast to that of old standards as is consistent with adherence to established exterior size and shape. The subdivisions are novel; the arrangement of the ceiling and approaches to it is peculiar, inasmuch as the ceiling is broader than usual in the center, and the approaches consist of a graceful curve, surmounted by a space for transoms; and admirable proportions have been maintained. The ceiling, instead of being decorated with a variety of colors, is covered with a heavy canvas, corresponding in color with the main body of the interior, excepting the wood-color, this color being a deep Pompeian red. The interior wood-work is all of oak, stained so as to be slightly darkened, and to resemble English oak. A series of frames of this material extends over the ceiling. The lower portion or dado of the car consists of a series of unusually small panels. Great care and skill have been displayed by the workmen at Altoona in manufacturing the interior wood-work, and it constitutes an exceptionally creditable combination of carving paneling, and molding. The leading elements of ornamentation may be briefly designated as skillful and artistic adjustment of this wood-work; frames of spindle-work introduced over the windows and at other places; a judicious intermixture of a considerable amount of *repoussé* brass work; original designs for brass lamps and solid brass ornaments or conveniences; and the free use, for decorative purposes, of brass-headed nails with circular heads, varying in size from about three-eighths of an inch to an inch in diameter, and inserted so as to make various combinations in the canvas that covers upper portions of the sides and ceiling. A remarkable feature of the interior is the arrangement of the baskets. Instead of projecting from the surface, they are virtually pockets extending downwards into the sides of the car, but with strips of brass, analogous in shape to material used in flat basket work, woven over the exposed cavity immediately above the deepest portion of the pocket. At the corners above these are *repoussée* brass ornaments representing flames turning downward and inward. These baskets have been made pivotal points of interior decoration by peculiarly graceful and elaborate wood-work leading up to them on either side, which might be called tympanums or portions of a broken pediment; and this entire structure is grouped in a very effective manner over the bay-win

dows and the spindle-work above them. Spindle-work is also introduced at other points than those hitherto mentioned, including the space over the doorway that separates the parlor from the ladies' toilet-room. The solid brass-work of the interior includes hat-hooks, the base of which is a globe or ball with three arms trending upward, and some small but very effective ornaments. The brass lamps are in accordance with striking individual designs, and in defiance of precedents, they are fastened exclusively by attachments to the top of the car, side braces or connections being avoided."

The car is mounted on six-wheeled trucks with 33-inch Allen paper wheels.

### The Thomas Patent Steel-Tired Wheel.

The engraving represents a new steel-tired car wheel, designed and patented by Mr. Theodore Thomas, President of the Jersey City Wheel Foundry & Machine Works. This wheel is now before railway managers. The security obtained from a cast-iron center, reinforced with a tire having an annular web by




which it is held to the center, as shown, is so readily understood that it needs no comment, other than to say that it is practically impossible to fracture such a wheel, through either center or tire, or both, in a way that will impair its safety.

The inventor's aim has been, first, to give to the wheel this item of safety, and to this end he has employed a section of tire and form of center as represented in the engraving; secondly, to construct the wheel with a non-metallic bearing for the tire of sufficient depth to intercept and destroy the vibrations common to cast-iron wheels, and steel-tired wheels in which the tire rests directly upon the metallic center; and, thirdly, to produce a noiseless wheel, and one adding life to the tire and axle by reason of the cushioning material employed. This is accomplished by casting a center having a series of pockets or recesses on its circumference, opening outward, formed by the back plate of the casting extending to the top of the pocket, and the front plate to about half the height of the pocket, and separated from each other by radial metal walls. Into these pockets are forced from the periphery of the casting wedge-shaped blocks of wood, so treated that there is no possibility of shrinkage or deterioration. The wooden blocks before insertion are of such size that the pressure necessary to seat them secures their retention in the pockets when the pressure is removed, and by reason of radial walls separating the pockets, and the wedge-shaped character of the blocks, a true seat is found for them as they are forced home, and when turned and faced off to receive the tire they extend slightly beyond the radial walls, the tire thus bearing only on wood.

The tire is either forced or shrunk on and secured by bolts passing through the internal flange and the radial walls, and having a bearing in metal their entire length, hold more firmly than when allowed to pass through the cushioning material.

Attention is called to the wheel as one of few parts, to its being noiseless and absolutely safe, to the facility with which it may be refitted with new tire, and that the life of the wooden bearing, which is indestructible, is measured only by the number of times the casting will admit of refitting to axle. The wheel will be manufactured by the Jersey City Wheel Foundry and Machine Works, and further information obtained by addressing Theodore Thomas, P. O. Box 129, Jersey City, N. J.

### Western Railway Club.

The first regular monthly meeting was held in Chicago, May 21. There was a good attendance, and a number of new members were admitted.

A standing executive committee was appointed consisting of President Verbryck, Vice President Bryan and Secretary Forsyth. Messrs. Pierce, Mackenzie, McDevitt, Cook and Reynolds were selected as a permanent committee on membership.

Two committees of two members each were appointed to present subjects for discussion, consisting of Messrs. Forsyth and Pullman, representing the master car-builders, and Messrs. Stevens and Reynolds for the master mechanics.

Some discussion was had concerning the best method of reporting the proceedings of the club and the matter was referred to a committee, which, later, recommended that verbatim reports of all the discussions be provided for. This report was adopted.

Mr. Forsyth exhibited a small model of the Eaton car roof. The Bodine Roofing Company, of Mansfield, O., exhibited a material for car roofs composed of wood-pulp made into a flexible board-like paper. Specimens of galvanized iron car roofing were shown by the Chicago Car Roofing Company; and the Wolverine Car Roofing and Paper Manufacturing Company, of Detroit, Mich., exhibited samples of a thick and heavy paper as a new material for car roofs.

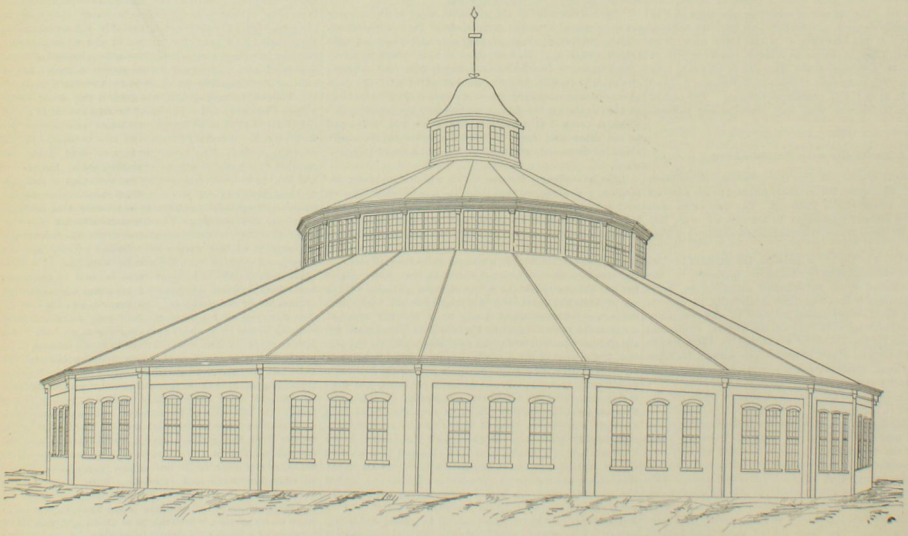
The next regular meeting of the club will be held September 17.

### New Passenger Car Shop of the Baltimore & Ohio Railroad.

The new passenger car round-house, which has just been completed at Mount Clare by the Baltimore & Ohio Railroad Co., and of which we herewith give illustrative engravings, is one of the most remarkable structures of the kind in the world. In the magnitude of area covered by one roof there is certainly no building in this country erected for a similar purpose that can be compared with it.

The diameter from outside to outside of wall is 244 ft. 9 in., and the height to top of cupola is 115 ft. The wall is 24 ft. in height, from which the roof rises to the base of the clear-story, which is 75 ft. from the ground and 15 ft. in height, and from this the central roof rises 19 ft. 9 in. to the cupola, the apex of which is 20 ft. higher. The main roof is carried on lattice girders, and is supported, together with the clear-story, by twenty-two wrought-iron pillars 75 ft. in height and composed of two 9-in. and two 12-in. channel irons riveted together. These pillars are placed in the form of a circle 100 ft. in diameter, inside of which is a 60-ft. turn-table from which radiate 22 tracks, as shown in the plan. These tracks are about 83 ft. in length, with a space of 28 ft. 7 in. between them at the outer ends, and 3 ft. 9 in. at the turn-table ends, or an average space of about 16 ft. There is room, of course, for only as many cars as there are tracks, but it may be doubted if any other form of structure can be devised that will house the same number, and at the same time afford the same available space for material and the movements of workmen. The facility with which a car can be taken in or out of the building, or transferred from one track to another by means of the turn-table, is obvious. The wrought-iron columns which support the immense roof occupy a comparatively small amount of floor space, and are at the same time abundantly strong to sustain the weight. The wall and clear-story windows admit plenty of light, and this advantage is heightened by the light color with which the interior is painted.

Altogether the building is a very handsome, not to say an imposing one, inside and out, and may be regarded as a significant sign of the progress that is being made in car construction and in the dimensions and costliness of the structures that are needed for carrying it on.



Passenger Car Shop of the Baltimore & Ohio Railroad Co., at Mount Clare, Baltimore, Md.

## Light Weighing of Cars.

S. H. Church, Superintendent of Transportation of the Pittsburgh, Cincinnati & St. Louis; Chicago, St. Louis & Pittsburgh; Jeffersonville, Madison & Indianapolis; and Indianapolis & Vincennes railroads, issues the following circular relating to light weighing of cars:

"Within the next six months, new cars that have been in service six months, and all other cars that have not been light-weighted for one year, should be re-weighed and marked at scales where cars can be had and there are facilities for marking them. All cars of the Southwestern system and Union line, National line and individual cars at home on the above lines, should be included in the weighing.

"Scales must be in proper order and weigh correctly, and cars clean and dry when weighed. Cars must be weighed singly and stopped on the scales before weighing. Weighmasters will keep a record of the cars light-weighed and report the weights to this office on Monday of each week. If none are weighed they will send a blank report. Car inspectors or persons in charge of marking will erase the old light weight marks, and stencil cars as follows: On both sides of cars the place, weight and date of weighing, thus—'Denn. Wt. 18,000, $\frac{6}{10}$ 83.' Box, stock, gondola and coal cars with fixed ends will be marked on ends thus —'Wt. 18,000.' Gondolas without fixed ends will be marked only on the sides in the center of car, that the marks may not be covered by the stake pockets. On stock cars with the double deck in, the letters 'D. D.' must be placed after the date on sides, thus—'Cols. Wt. 19,900, $\frac{7}{10}$ 83 D. D.,' and after the weight on ends, thus—'Wt. 19,300 D. D.' On first weighing of all new cars the word 'New' will be placed after the marks given above, and at the end of six months after date of weighing such new cars, they must be re-weighed and the correct weight marked, erasing the word 'New.'

"Cars of any of the lines above named should be weighed at the scales of any of the lines that are light-weighing cars. In weighing loaded stock cars that have been light-weighed with double deck in, should the double deck be out of car, weighmasters will deduct 1,200 pounds from the light weight of the ordinary sized stock cars, and 1,500 pounds from the large stock cars of 40,000 pounds capacity, that being the weight of material in double deck, and add 1,200 and 1,500 pounds respectively to light weight of single-deck cars that have had double decks put in after being weighed as single-deck cars."

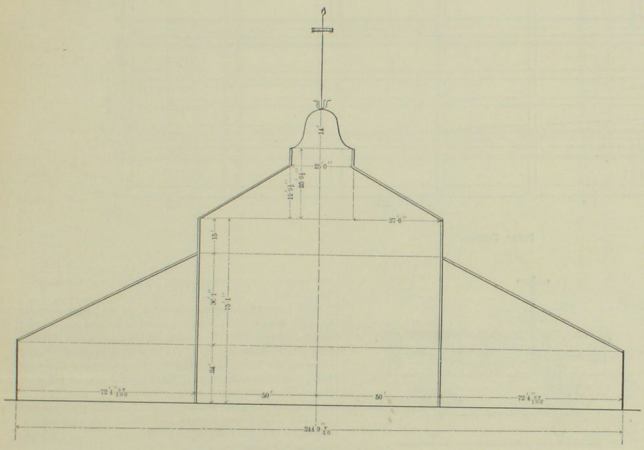
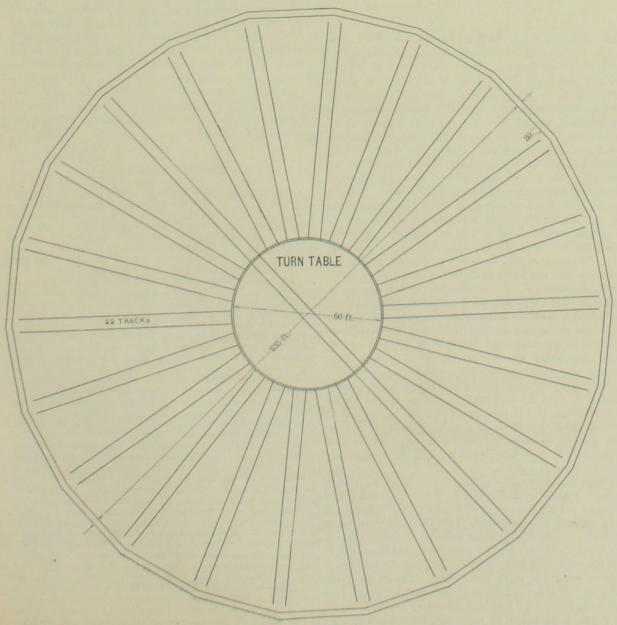


Diagram of Dimensions.




Plan of Tracks and Turn-Table

## The Inside Finish of Passenger Cars.

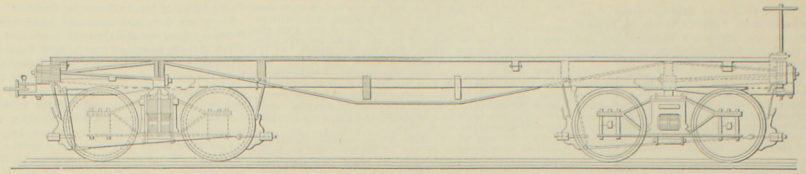
*To the Editor of the National Car-Builder:*

There are few intelligent and observing people who travel much on our great railway lines that are ready to admit that the passenger cars on such lines, taking them all together or collectively, are quite as good as they should be in the matter of inside decoration and finish. There are, to be sure, a great many new cars, fresh and clean, rich with costly woods and brilliant with varnish, and many also of the same class that are only a little less attractive after six months' or a year's service. But it is no exaggeration to say that, with the exception of our fast through trains, a very large proportion of the passenger cars now running are "shabby"—to use a word which Dr. Webster said was the most expressive one in the English language. This shabbiness is not an absolute thing, but varies in degree from little to much, and may be traced to three causes, namely, the age of cars, neglect to keep them in good condition, and an original vicious construction, decoratively. To these old and neglected cars, travelers of the discriminating sort have a growing dislike, which is aggravated by the indifference of road managers in the matter of applying a remedy. This indifference is in some cases due to sheer inability on the part of the company to keep its cars in first-rate condition without absorbing too much of the earnings. In other cases it is owing to the fact that the managers do not really know how their cars do look. They rarely ride in local trains or in day coaches, hear few complaints and only know that they have so many two-year-old cars, that the average age of all their cars is only five or six years, and that the master car-builder says they are all strong and sound, and will last a good while yet—all of which may be very true. The car-builder himself is perhaps unwilling to admit that a car that has not been in the shop for two years is not fit to be put into a first-class train, because such an admission would imply that he is not capable of building a car with a durable inside finish, which would, of course, lower the estimation in which he may have been held at headquarters.

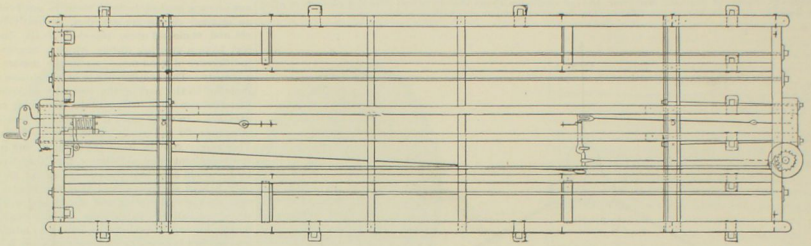
But let us try and get at the facts. It may be assumed that a passenger car for ordinary service will last eight or ten years, and when very well built, even a longer time. With fair attention, it will be in apparently good condition, and if not out of fashion in the matter of "modern improvements," or too carefully inspected, it will last a full round decade without suffering by comparison with newly built cars. But when the inside of it is regarded as an apartment in which a large number of people of average respectability are to spend a considerable portion of their time, it is seen to be not quite up to the requirements of modern taste and usage. At the end of twenty months the prevailing styles of finish begin to lose their freshness, and in two years and a half become decidedly dingy and off color—worn out, in fact. The car has held its own tolerably well for one-third of its estimated life and no more. Now, this is not as it should be. There is no sufficient reason, except a vicious method of finishing, why the inside of a car should have a worn out and dilapidated appearance in such a short time, while its frame-work is as substantial as ever, and passengers can ride in it as safely and as comfortably as when it was new. There are hundreds of cars of this kind that have been running from five to eight years, but which look inside like well-preserved relics of antiquity. The root of the evil is to be found in the finishing, which may be characterized in a general way as a kind of bastard Eastlake, equally devoid of beauty and utility. This so-called Eastlake style broke out some years ago in England, where it has since raged like an epidemic. It was originally intended to apply only to household furniture of certain kinds, the fundamental idea being that in this class of construction there were too many curves, and that tables, easy chairs and such things should be made more square, straight and angular, so as to show how the parts are put together. This idea once started, became not only a fashion but a craze. All wood decoration and surface color designs must needs conform to it in some way or be sent to Coventry, artistically speaking. The craze got into the car shops in this country, and reputed examples of "Eastlake" were seized upon and made the basis of the rectangular style now so prevalent in car decoration. Mr. Eastlake, having no eye for color, became the apostle of neutral tints. This idea also made its way into the car shops, and culminated in darker hues bordering on the dismal. Everything became as angular as a carpenter's square, and ugly in proportion.

The use of solid hard woods, whether light or dark in color, has been attended with another drawback growing out of the Eastlake theory that the wood surfaces should have no protecting coatings, the idea being that if left bare the wood would turn a richer color. With light woods, however, as soon as the varnish is gone the dirt gets into the pores and destroys the natural color, which can only be restored by an entire removal of the original surface. With dark wood like mahogany the case is different. Its peculiar richness in color is not brought out until it has been exposed to the light for several years, and then it becomes darker and richer. Carrying the fashion for the somber to extremes, we now have cars lined with solid mahogany from floor to ceiling, making the interior so dark, even when the cars are new, that a dozen lamps

STANDARD GONDOLA CAR—CENTRAL PACIFIC RAILROAD.



Longitudinal Section and Side Elevation.

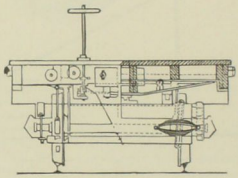


Floor Frame.

are required to light them up so as to make them pleasant and enable passengers to read in the night time. As the wood becomes darker with age more lamps will be necessary. This style of finish, now so prevalent, and withal so costly, being without the proper relief in the way of color contrast, will grow more and more dismal as the public become more and more surfeited with it. The cars will have to be overhauled before the finish or the frames are in need of any considerable repairs.

So much in the way of fault finding. To point out alleged defects is easy, much easier, as every one knows, than to suggest well-considered and practical remedies. The important question is, can any thing be done to improve the inside finish of cars so as to make it more agreeable to a cultivated and discriminating taste, and at the same time more durable?

I am persuaded that a great deal can be done in this direction, but it can not be done by a mere stroke of the pen, or by erasing one line in the car-builders' specification and substituting another. The end can only be attained by diligent study and investigation. The existing styles of finish will have to be very considerably modified. In the designing of improvements there must be a more thorough appreciation of what is beautiful in itself, regardless of what may be the prevailing fashion for the time being. I would say that as a preliminary step the Eastlake style—if it can be called such—will have to be abandoned, except so far as its methods of using wood tend to secure the greatest strength. These methods will have to be retained, not as a controlling element in decoration, but rather as subsidiary to it. The main thing is to provide the proper contrasts, and avoid combinations that are discordant. In cars where light-colored wood is used for sides, ends, doors, panels, etc., the first improvement to be introduced is to make the seat-arms, seat-frames, window-sills and moldings, the jambs of the windows and seat-bands, of dark wood instead of light, something that contrasts well with the general or prevailing color. Mahogany, for example, contrasts well with ash and maple, or, if stained so as to take on something of the shade of amaranth, the contrast will be still better. Amaranth itself contrasts beautifully with many of the lighter woods, but it costs too much to be used in car work to any great extent. Another reason why the parts named should be of dark wood is, that whenever a light-colored wood is exposed to wear it begins to grow dark with dirt as soon as the varnish is rubbed off, and the original color cannot be restored without removing the surface. Mahogany, however, only grows darker and richer under these conditions. It is obvious that a contrast of color is far more effective than an unvarying uniformity. It should furthermore be said, that instead of making the inside entirely of mahogany, it would be better to put in light-colored wood panels over and between the windows, and either this or some other light-colored material should be used to light up the ends of the car. The window curtains, which are now rapidly taking the place of slatted blinds, should also have some decided color instead of the usual dull "tertiary" so much admired by the artistic cockneys of the present time.



End Elevation and Section.

Upon the treatment of the head linings, or ceilings more properly, the decorative completeness and harmonious retionship of the whole interior very much depend. Except mahogany moldings, all dark wood should be banished from the ceilings. While it is not desirable to return to the old painted canvas, it is clearly impossible to have a clean, unsoiled, cheerful-looking car with exposed wood-surface ceilings. The heat and smoke from gas burners and lamps discolor both the varnish and wood, so that restoration is out of the question. Still, it must be admitted that wood, although rather heavy, is the best material that has yet been used for this purpose. What is wanted is some kind of covering for it capable of being decorated, but which can be renewed or repainted from time to time, so as to look as well as at first. Lincrusta-Walton, the new material for wall decoration, is highly spoken of as being tough, flexible and durable, impervious to moisture, and not liable to shrink or crack from variations of temperature. Its application to ceilings would take the place of decorative work on the wood itself, while it could be renewed as often as circumstances might require. Gilding should be sparingly used upon ceilings. The effect is decidedly bad when it is used to excess. Painted decoration directly on the wood is ugly, even when it is new, and has the further disadvantage of fading or losing its freshness rapidly. Light-colored panels, separated by dark natural wood moldings, should be the rule for ceilings, and if these moldings can be stained an amaranth color, the effect is very beautiful. Ebony, or woods stained in imitation of it, is not suggestive of hilarity, shows dust very quickly, and the color exaggerates every little scratch.

Carving, if judiciously employed, can be made a very pleasing feature of embellishment. But it must not be too prominent nor too poor in quality, and as for imitation, it should not even be thought of. Little bits stuck on every panel interest nobody. It is far better to put their cost, or many times their cost, into an elaborate piece for each end of the car, executed with sufficient boldness to be seen at a distance twenty or thirty feet. They will then be worth looking at. If there is no convenient place for them, it is better to dispense with carvings altogether. At all events, they should be executed in wood that improves with age, and be placed high enough to be out of the reach of people's fingers.

With regard to plush upholstery, most car-builders appear to think that when it becomes faded and soiled it is beyond repair or renovation. So confirmed are they in this opinion, that sundry processes that have been devised for effectually cleaning the fabric and renewing the color, have met with little or no encouragement. These processes, or some of them at least, are entirely practical, leaving the plush nearly or quite as good as new, removing grease and dirt and destroying vermin, and doing this without the necessity of taking the cushions from the car or of detaining the car longer than a day or so.

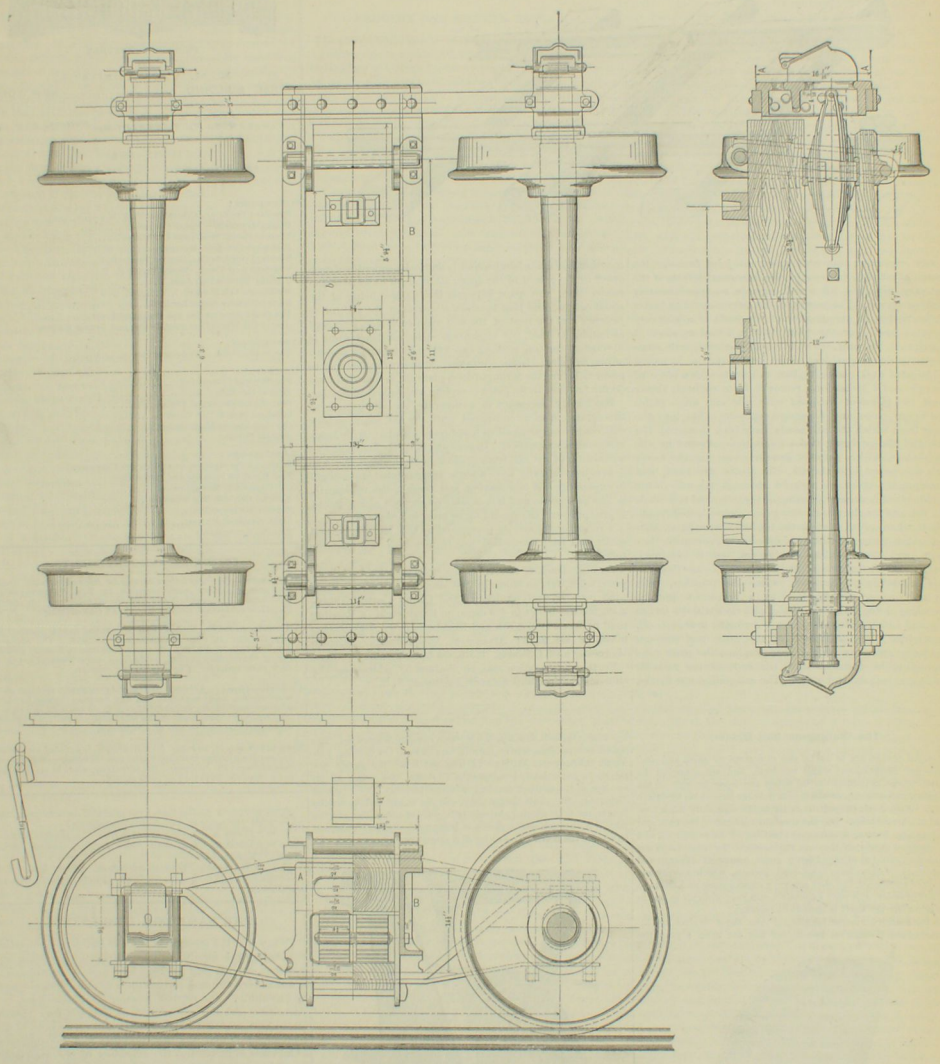
In what I have said I have only indicated some of the prominent points in the inside finish of passenger cars which in my judgment are worthy of consideration, as likely to make such finish not only more durable, but more in conformity with the principles which are recognized in all true decorative art. I have, at the same time, endeavored to keep in view the economic advantages in the way of reducing the cost of car embellishment, by changes in the prevailing styles more or less radical, without sacrificing any of the essential elements of beauty, but on the contrary by giving to these elements a more effective and satisfactory development.

INSPECTOR.

### Running Locomotives.

"Lots of chaps think it would be fun to run an engine," said the driver, as he stuck his head, a flaming torch and a long-necked oil can in under his machine, "but if the most of 'em would try it they wouldn't like it quite so well. 'Taint everybody can run a locomotive either, though I s'pose it's like running a daily newspaper, which I've heard tell everybody can do. Now, a nervous man has no business in a cab; no more has a careless one or a stupid cuss. To run an engine a man must feel his responsibility, and keep his head level. I don't believe half the people know what it is to run an engine. Now, there's the machine; that is the first thing, and it has to be in good order, and stay so. A locomotive has to stand wear and tear and weather that'd knock a stationary engine into smithereens. And no matter what emergency rises—freezing of pipes or starting of flues, a loosening of packing or heating of journals—we've got to know just what to do, and do it right quick, too. Then when we're running there's the time-cards, and pretty often a new one. And the train orders—they are life and death and reputation to us, and to read 'em correct and to live up to 'em gives us no end of anxiety. Bet I've read a train order over a dozen times an hour—I am always so afraid of making a mistake or forgetting. You know the consequence of even a little mistake sometimes. Then, there's the signals to watch, the conductor's gong overhead, steam to keep up, time to make, whistle-posts and crossings to look out for, bad spots in the road to be careful on, and along with all this, there's the track ahead of ye which your eyes mustn't leave for more'n five seconds. There's the brakes, too—one is always worrying about them. I don't s'pose everybody knows, either, that we have to be mighty careful when we come to the top of a grade. You see in going up she labors hard, and so as soon as she begins to descend she makes a rush, and there's the danger of breaking your train when the rear cars are still dragging on the up grade. This danger is especially great on freights, but no good engineer fails to shut off some of his steam when his engine reaches the summit. It isn't every fool that can run a locomotive.—*Chicago Herald.*

STANDARD LOW TRUCK—CENTRAL PACIFIC RAILROAD.



THIS truck has 28-inch wheels, with a distance of 4 ft. 10 in. between centers of axles. The axles are the M. C. B. standard. The frame of the truck is of iron and the bolster of wood. In its construction there are some peculiarities which will be apparent from an examination of the drawings.

Between the arch-bars is bolted or riveted a stout end-casting with two openings in it. A section of this casting is shown at A in the side elevation. A pair of channel bars *B*, with their backs inward, are riveted to the casting, and between them are the swing-beam and spring-plank. These end castings, with the arch-bars, constitute the main frame of the truck, and the connections being of the strongest description, the result is a structure of great stiffness and durability. Elliptic springs are used on the swing-beam and room is made for them by an opening 7¼ inches high by 11¼ wide in the casting. The swing-beam has ¼ inch play between the two inside faces of the channel bars, and is hung with 22-inch links in the usual way. The upper arch bar is 1¼ in. in thickness, the lower one 1 in. and the tie bar ⅝ in. and all of them 3 inches wide. This distribution of the iron, in combination with the channel iron transoms, the iron of which is 12 inches deep by ⅝ inch thick in the web, is probably about as good as could be for securing the greatest strength. The channel bars are attached to the castings by rivets, and the castings are also riveted to the upper and lower members of frame. The use of rivets in many kinds of car work, and especially in certain forms of truck framing, is undoubtedly to be preferred to bolts and nuts, as being cheaper and more durable.

On the opposite page we give, on a reduced scale, engravings of the standard gondola car of this road. The length over all is 28 ft. There are 4 truss-rods the whole length of car, passing over the bolsters and into the end sills. The bolsters are of iron, bent down at the ends to pass under the side sills. The stake-pockets on one end are placed on the inside of the end sills, and on the other end are bolted to the sills a foot or more inside the end. The brakes are hung from the body by S-shaped links. The trucks are the same as shown above.

### Railway Association Conventions.

June 11.—Yard-Masters' Mutual Benefit Association. At Atlanta, Ga. Secretary, Joseph Sanger, Indianapolis.

June 10.—Master Car-Builders' Association. Annual Convention. At Saratoga Springs, N. Y. Secretary, M. N. Forney, 71 Broadway, N. Y.

June 17.—American Railway Master-Mechanics' Association. At Long Branch, N. J. Secretary, J. H. Setchel, Cincinnati.

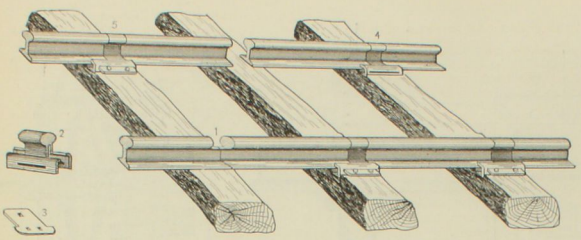
September 3.—Master Car-Painters' Association. At Boston. Secretary, R. McKeon, Kent, Ohio.

October 15.—American Street Railway Association. At New York. Secretary, J. W. Richardson, Brooklyn, New York.

September 16.—Association of American Railroad Superintendents. Semi-Annual Convention. At Young's Hotel, Boston. Secretary, Waterman Stone, Providence, R. I.

January, 1885.—National Association of General Baggage Agents. At Boston. Secretary, W. B. Starring, Chicago.

## THE GIBBONS BOLTLESS RAIL JOINT.



THE engraving represents a new rail joint fastener, the design of which is to remedy the inherent defects of the ordinary fish-plate joint and provide an approximately continuous rail. The merits of the device could be better understood by an examination of the parts of a well constructed model, or the joint itself in actual service. A description, however, with the aid of the cuts, will serve to convey a very good idea of the invention.

The joint at (1) shows the two rail ends with a piece of the rail head 2 inches long removed from each; (2) shows these two pieces of the head with side and angle plates cast in one piece, and forming a cap which fits into the space from which the rail heads have been removed, the web and flange being at the same time covered by the angle plate, which extends downward so that the lower ends are boxed into the tie. No bolts are used, and consequently there are no holes through the web of the rail, the joint fastener consisting of the detached rail heads and fish and angle plates, being one consolidated piece, which, when spiked down to the tie, locks the rails together and makes them practically continuous, preventing low joints and transmitting unbroken, as is claimed, the wave of deflection in advance of the wheels. This consolidated fastener, when in position, acts not only as a girder, but as a brace to prevent spreading of the track. In this girder (2) is a slot 8 inches long and ¼ inch wide, to receive a wrought-iron-plate (3), upon which rest the flanges of the rails, and through which the spikes are driven into the ties, the plate thus completing the encasement of the ends of the rails on their tops, bottom and sides. The rails, although locked together, can move longitudinally and independently of each other to the extent of the space allowed for expansion and contraction; the space between the flanges being of the usual extent, and that between the ends of the rail-top of fastener and the tops of the rail upon each side, only half as much, so that the expansion space at the bottom is divided at the top, making two half-size openings instead of one full size. In the engraving (4) shows the fastener in position before the wrought-iron plate (3) is inserted, and (5) the fastener in its place complete and spiked to the ties.

It is hardly necessary to enumerate the advantages of this arrangement as compared with the fish joint, as they will readily occur to all railroad men familiar with track wear and maintenance. In getting rid of the bolts, a great weakening of the rail from drilling holes through the web is avoided, the rails have a more unobstructed movement in expanding and contracting, and there must necessarily be less lamination and less trouble on account of low joints. It also prevents the spreading or creeping of track.

A record of the service performed by this joint on several roads has been furnished us, from which we take the following:

On main track of Albany & Susquehanna road in Albany yard, 5,700,000 ton blows in 200 days; on Hudson River road, between Spuyten Duyvil and Grand Central Depot, 2,592,000 ton blows in 439 days; on Philadelphia & Reading road between New York and Elizabeth, N. J., 2,328,000 ton blows in 481 days; Albany & Susquehanna, between Worcester and Oneonta, 2,576,000 ton blows in 442 days.

Further information may be obtained by addressing The Gibbons Boltless Rail Joint Co., Albany, N. Y.

## The Wellington Belt-Holder.

Several devices are in use by the operators of mills and factories for stopping any single machine, and not stopping the motive power, principal among which are loose pulleys on the machine, necessitating double-width driving pulleys on the main shaft. With these, the shift is easily made, especially when confined to narrow belts. But the constant running of the belt, and the wearing, heating and frequent rattling of loose pulleys, and the constant strain on the line shaft when the machine is not wanted to run, has always been a great source of expense and annoyance. Others have tried dead pulleys, which have some points of excellence, but they are very cumbersome and liable to get out of order, and very expensive, and very difficult to put in position after the shaft is already in position.

In the search for something better than these devices, the inventor of the Wellington belt-holder has hit upon a plan, the

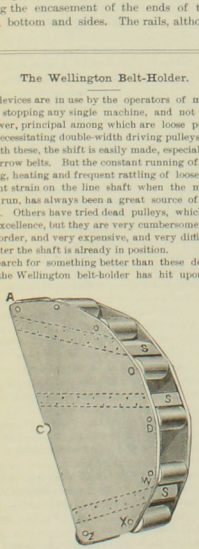


Fig. 1.

first cost of which is less than the loose pulley method, and only a small part of the cost of dead pulleys.

The device consists of a series of rollers turning on iron axle bolts supported at both ends in a strong frame, and arranged in a curved line so that most of the rollers, say from *A* to *X*, Fig. 1, shall be level with the face of the driving pulley on the line shaft, beside which it is placed in such position that the belt can be easily thrown from the driving pulley on to the holder, or from it back to the pulley, at will.

The roller at *A*, Fig. 1, is placed opposite that point on the pulley where the belt first touches it when running toward it. The holder is supported nearly parallel and close to the driving pulley by the braces or hangers. It does not touch the pulley nor the shaft, so the latter is relieved of all strain, and being all on one side of the shaft, it can be put in position any time without disturbing the shaft or hangers. It is firmly bolted to the braces, the bolts passing through both sides of the holder and the sides *S S*, through which plenty of holes are bored before shipped to receive the bolts. The roller *Z* is sometimes placed inside the

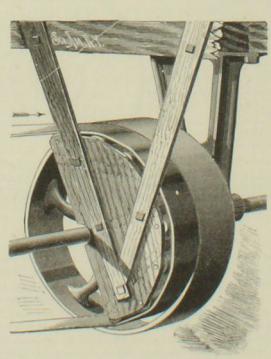


Fig. 2.

pulley circle, so that when the belt is on the holder it is strained less than when on the driving pulley. Fig. 2 shows the holder in working position.

Although this device has been offered the public but a short time, we are informed that several hundred, all the way from 12 inches diameter, 2-inch face, to 94 inches diameter, 14-inch face, are now in successful use by many of the prominent manufacturers of the country.

W. R. Santley & Co., Wellington, O., are the manufacturers, who will furnish further particulars upon application.

NATIONAL CAR BUILDER

PUBLISHED MONTHLY
BY
R. M. VAN ARSDALE,
MORSE BUILDING..... NEW YORK.

JAMES GILLET,
WM. H. PARTRIDGE, } Editors.

JUNE, 1884.

## CONTENTS.

ILLUSTRATIONS: Page.
Standard Fruit Car—Central Pacific R. R. ..... 68, 69
Griggs' Locomotive Spark Consumer ..... 71
Thomas Patent Steel-Tired Car Wheel ..... 72
Passenger Car Shop, Baltimore & Ohio R. R. ..... 72
Standard Gondola Car, Central Pacific R. R. ..... 74
Standard Low Truck, Central Pacific R. R. ..... 75
Gibbons' Boltless Rail Joint ..... 76
Wellington Belt Holder ..... 76
Burrell Railway Signal Lantern ..... 78
The Smith Exhaust Fan and Pressure-Blower ..... 79
Gowan Car Wheel Centering, Boring and Truing Machine ..... 80

COMMUNICATION:
The Inside Finish of Passenger Cars ..... 73

EDITORIALS:
The Saratoga Convention ..... 76
Freight Car Buffer Blocks ..... 77
Size of Fast Passenger Trains ..... 77
Standard Freight Car Truck ..... 78
Car Couplings in Massachusetts ..... 78
Journal Friction ..... 78

MISCELLANEOUS:
Subjects to be reported on at Saratoga Convention ..... 70
New Woodruff Sleeping and Parlor Cars ..... 70
Car Couplers in Massachusetts ..... 70
A Parlor Car with Bay Windows ..... 71
Western Railway Club ..... 72
Light Weighing of Cars ..... 73
Running Locomotives ..... 74

## EDITORIAL ANNOUNCEMENTS.

**Addresses.**—*Business letters should be addressed, and drafts and money orders made payable, to* THE NATIONAL CAR-BUILDER. *Communications for the attention of the Editor should be addressed* EDITOR NATIONAL CAR-BUILDER.

**Advertisements.**—*Nothing will be inserted in this journal for pay,* EXCEPT IN THE ADVERTISING COLUMNS. *The editorial department will contain our own views and opinions; and the rest of the reading matter, aside from advertisements, will be such as we consider of interest to our readers.*

**Contributions.**—*Articles relating to railway rolling stock construction and management, and kindred topics, by those who are practically acquainted with these subjects, are especially desired. Also early notice of changes in railroad officers, organizations and names of companies.*

**Special Notice.**—*As the* CAR-BUILDER *is printed and ready for mailing on the last day of the month, advertisements, correspondence, etc., intended for insertion, must be received not later than the 25th day of each month.*

SUBSCRIPTIONS *to the* CAR-BUILDER *will be received, and copies kept for sale, at the following places:*
A. WILLIAMS & CO., 283 *Washington St., Boston, Mass.*
L. SCHAFFNER, *Cigar and News Dealer, Grand Pacific Hotel, Chicago, Ill.*
WILLIE H. GRAY, 306 *Olive Street, St. Louis, Mo.*
ROBERT CLARKE & CO., 65 *West Fourth Street, Cincinnati, Ohio.*

## THE SARATOGA CONVENTION.

To say that the meeting of the Car-Builders' Association at Saratoga this month is a more important one than any previous meeting that has been held since its organization, is not a mere common-place truism devoid of significance and meaning. The regular meeting at Philadelphia two years ago, and the special one at Niagara four months afterwards, were both highly important on account of the reorganization that was then matured and consummated as a means of increasing the efficiency of the association by giving it a representative character. This was a new departure, a radical innovation in fact, and very naturally caused some doubts as to the expediency of the movement. The working machinery having been perfected at Niagara, its capacity to do what was expected of it could only be tested by subsequent meetings. According to the official report of the meeting last summer in Chicago, the membership of the association then consisted of 136 active and 54 representative members, these latter representing 357,000 cars, or nearly one-half of all the cars in the country. There were present at the Chicago meeting 110 active and 25 representative members, representing 234,000 cars, or something less than one third of all the cars in the country. This accession of representative members on the car basis was the chief feature of the new arrangement that was to infuse new life into the Association by giving it a status with the railroad companies that it had previously not been able to attain. Its revenue has also been increased under the new order of things from an average of some $350 per annum in former years, to $2,115 for the year ending in June 1883, with a probable further increase during the past year that will swell the amount to $3,000. This is certainly very satis

factory evidence of progress so far as organization is concerned, and if the meeting at Saratoga shows a further increase in the membership, and the ability to deal with sundry important matters to be reported upon by committees, so that the immediate outcome will be something in the shape of recommendations that are practical and definite, the usefulness of the Association will become an established fact. If such recommendations fail to remedy the existing defects in car construction, reduce the operating expenses of the car departments, insure a greater degree of safety, and bring about a more effective co-operation on the part of road managers, the responsibility will rest upon the companies themselves. Some of the largest and most influential of these companies are now represented in the Association by their accredited delegates, and it is expected that this branch of the membership will be steadily increased until the organization, in whatever action it may take, will be regarded as the exponent and mouthpiece of the companies represented.

The subjects upon which reports are to be made at the Saratoga meeting by the committees appointed last year, are none of them very new, as will be seen by the list we print elsewhere, but they are none the less important. From the composition of these committees, and the fact that sufficient time has elapsed since its reorganization for the Association to get into pretty good working order, it is reasonable to expect that these reports will be such as to lead to some definite action so far as the nature of the subject in any case will admit. The great point is to come to an agreement as to what shall be recommended as standards of construction, a subject which has been agitated for years without making any very perceptible progress, not because railway men are so unreasonably tenacious about their individual notions, but because railway service ever has been, and is likely to be for a good while yet, in a transitional state, resulting from the demands of an ever-increasing traffic. A maximum freight-car load is an ever-increasing quantity. It does not decrease or fluctuate, but steadily grows. If it could be fixed *somewhere*, a great point would be gained in determining upon standards, whether of trucks, car bodies, drawing gear, axles, wheels, etc., for all these are affected by the weight of the load. If the committee on the subject of a standard "house-car" to carry 60,000 pounds can agree as to its construction, and if the report, after passing the ordeal of the executive committee and the Association, shall reach the road managers in the form of a recommendation and be adopted in good faith by roads owning three-quarters of all the cars in the country, it will certainly be a very good thing so far as carrying loads of that particular weight is concerned.

At the same time it must be said that there are difficulties in the way of the ultimate adoption of a box car or freight truck of such dimensions and details of construction as may be recommended as standards, that are next to insurmountable; and these difficulties, instead of being diminished by the growing necessity for such standards, as a means for cheapening the cost of transportation, are actually increasing. We do not expect, therefore, that any very marked progress in this direction will be made this year or next, except so far as these obstacles may become more clearly defined and better understood by investigation.

As regards standards and appliances for the greater safety of train men, it would seem that about everything that is practicable has already been done by the Association in the recommendations that have been made from time to time in years past. The trouble is that little or no attention is paid to the means of protection that have been recommended, and were the mechanical appliances of this class ever so good in themselves, they can not be expected to prevent accidents in the absence of ordinary prudence and the instinct of self-preservation on the part of the victims. Automatic couplings have been talked about as the one thing needful, and a thousand of them, more or less, have been invented. Five of these, presumably the best of the lot, were selected by a committee of the Association a year and a half ago as being worth a trial. The selection of this small number and the designation of each by its name was a great step in advance, there being no precedent for it that we can recall in the previous history of the Association. These five devices, we have authority for saying, have all been in use and have proved more or less satisfactory, and that the progress during the past year towards getting an automatic car-coupling has been so encouraging as to warrant the prediction that in another year a selection will be made that is likely to meet with general acceptance.

The programme of business to be transacted at Chicago ought to insure a very full attendance. There will be fewer outside diversions than there were at Chicago last summer to consume time and distract attention, and on this account the proceedings are likely to be more interesting. With respect to the discussions, we venture to suggest that if some of the members who have hitherto been conspicuous for their silence could be induced to speak out more freely, it would be gratifying, not only to the comparatively small number who usually do about four-fifths of the talking, but to the great outside audience who read the reported proceedings. There is a good deal of thinking done at these meetings that would be of some service if the corks could be drawn and the bottled ideas allowed to flow out in words. We hope these taciturn gentlemen will become more talkative under the new régime, so that the speech-making may be a little more evenly distributed than it has been.

## FREIGHT CAR BUFFER BLOCKS.

The comparative utility of single and double dead blocks on freight cars is a question that has been discussed at the car-builders' meetings for many years without arriving at any result except an agreement to disagree, or in other words, to fix upon certain dimensions that will prevent single blocks from interlocking with double ones, leaving the intrinsic merits of the two methods, in respect to safety in coupling, as unsettled as ever.

The old double blocks, placed far apart, were for a long time the only kind in use, and as they were really very dangerous and the fruitful cause of innumerable accidents, they have very appropriately been called "man-killers;" and so great has been the prejudice against them that any kind of double block arrangement is regarded by a great majority of car-builders with unqualified disapproval. There is, however, a very respectable minority, including car-builders and railway officials of large experience upon lines of heavy traffic, who believe that double blocks, if properly placed, are attended with less danger to train-men, and are also more serviceable and a far better protection to the cars than single blocks are, and that the designation of "man-killers," in its general application to the use of two blocks instead of one, is quite undeserved.

After a careful consideration of the problem, we are inclined to think that the minority is right, and that double blocks are the best. They resist buffing strains better, they save the springs and draw-gear, are not destroyed by the gradual or sudden failure of the springs, and what is more important than all else, they are safer. We do not mean blocks spaced 40 inches from center to center and extending far below the sills. With such blocks, coupling is necessarily dangerous. If the hand is used instead of a stick, it is pretty sure to be caught unless the pin is dropped at the critical instant and the hand snatched away from between the approaching blocks. The single block is placed directly above the draw-bar, in which position the buffing strains are transferred to that portion of the car body least able to sustain them, and in connection with the block on the opposite car it is a kind of trap, which, in case the springs fail, becomes a much more effective amputator of fingers and hands than the old-fashioned wide-spread double blocks. Lastly, in the rapid wear to which it is subjected, it soon becomes partially destroyed in ordinary service, and in this condition the hand is liable to be caught between the pin and block in the act of coupling.

To resist the strains in buffing, a car has usually four longitudinal timbers—two center sills and two intermediates. The side sills are comparatively of little account. The reliance being almost entirely on the four inner sills, the construction of the lower frame should be such as to enable these sills to resist the buffing blows with their full strength, or directly on a line with their ends. But instead of doing this, the blows are usually taken below the line of effective resistance, or underneath the sills, and then transmitted through the draw-timbers upward to the sills themselves, which is partly equivalent to a thrust from underneath, the tendency of which is, first, to cripple the draw-timbers and break them from their hold on the sills, and secondly, to pull down the sills themselves, straining and often breaking them transversely across the bolsters. The draw-timbers are almost of necessity too light for their work, and when the springs and side castings hold, they will be found after some service to have their inner ends more or less battered and broomed. Even if their weight is increased so as to insure the necessary strength, it is an unmechanical, roundabout way of transmitting a blow which might just as well be transmitted directly and in a straight line. The attachment of the side irons to the timbers, and the timbers to the sills, is also mechanically difficult, and to make the work strong, it must be both heavy and costly. A draw-spring, too, even with a capacity of 18,000 pounds, must entirely close with the severe pounding it gets, and then the strain comes wholly on the timbers; and it must also be understood that the frequent exhausting or closing of such a spring diminishes its power much faster than if worked inside of its limit of capacity.

With double blocks, rightly arranged, the conditions are entirely different. The draw-bars, with their springs, are not expected to stand all the buffing, the draw heads projecting only so far beyond the face line of the blocks as to save the springs from doing anything more than their proper work. When this point is reached the springs are relieved and the blow is received by the blocks on a line with the center sills where there is the greatest strength to resist it. The draw-timbers take only so much as the springs can safely stand, and this is not so great a strain as to make it very difficult to fasten the timbers securely. The springs being protected so they will not close, they will of course last longer and be more effective as draw springs. These considerations, however, are of secondary importance as compared with the element of safety in the dangerous operation of coupling, and in this respect double blocks are much to be preferred to single ones. When properly applied, the distance between them is only a little more than the width of the draw-head, and when two cars are being coupled, each having double blocks and drawing attachments of the same description, the man who goes between them to do the coupling is as perfectly protected as the nature of the case will permit. So long as the ends of the two cars remain intact, there is ample room for his body, at all events; and as for his hands, the advantage is still with the double blocks, the space between them forming a pocket or harbor of refuge within which the hand can be placed without danger of being crushed. With single blocks, in case the springs have become weakened or the connections slack, the pin is apt to be driven back so as to bring the blocks in contact, thus endangering fingers, or perhaps the whole hand. That springs do become weak and connections slack is evident from the fact that, on most cars having single blocks, the wood gets battered even when the cars have been running but a short time. In case the contact is so violent as to break both springs and draw-timbers and drop the draw-heads, there is no escape for the man who is between the cars, although perhaps there is an even chance that he may save himself alive in case the blocks are not entirely crushed.

In respect to the breakage of draw-gear, there can be no question that it is very much less with double blocks than with single ones. On some roads that use double blocks the breakage of draw-gear is so exceptional as to be quite out of the general line of repairs, while upon roads using single blocks, it is probable that one half of the whole number of such cars are sent to the shops on account of some trouble with the drawing attachments, and for nothing else.

## THE SIZE OF FAST PASSENGER TRAINS.

The growing tendency to increase both the weight and speed of trains is accompanied with conditions some of which it is difficult to provide for, while there are others for which no provision can be made by any appliances that can be adopted. It has been suggested whether the difficulty could not be overcome to some extent by the use of lighter cars for fast trains, and in this way lessen the burden on the motive power. That cars can be built that will be lighter, and even stronger than those that are now running in these trains, there can hardly be a doubt. But while the dead weight can thus be reduced to the lowest practicable minimum, it is a question whether it would be any relief to the engines that haul the trains. There is every indication that the length of trains is likely to be increased rather than diminished, which involves, of course, an increase in the aggregate weight of cars, although the weight per passenger may be less than it now is. At all events, there will be no falling off in the total weight of the cars.

In fast running there are two causes which limit the speed. When the size or weight of a train is considerable, the weight limits the capacity of the engine to a certain speed, which may or may not be what is required by the schedule, and beyond which it cannot go. And then, irrespective of the weight of trains, there is a limit to the power which can be developed by any passenger engine of the ordinary types of construction. With the American engine this limit has been reached. This is manifest from the fact that upon roads where attempts are made to exceed it the trains are uniformly behind time, or, if there is any exception to the rule, it is owing to circumstances that are also exceptional. Other roads, in view of the hopelessness of getting more out of this class of engines than they are capable of performing, have been making attempts with other types, and have attained a certain measure of success. As the problem is usually regarded, it is assumed that if sufficient adhesion can be obtained there can be no difficulty (the cylinders being of proper size and the boiler capable of generating steam enough to supply them) in running trains of a given weight at any desired rate of speed not exceeding 60 or 70 miles an hour, the road-bed being as perfect as it can be and the rails heavy enough to stand the pressure of the driving wheels. The minor difficulties need not be alluded to, since they are not so great but that they may be overcome.

The vital thing is whether a train of 20 or 25 American passenger coaches can be hauled over tracks that are in good condition at an average speed of 50 miles an hour. If the run between New York and Chicago could be made without making any stops, except for coal and water, there would be no difficulty in doing it. There are passengers, however, at a dozen large towns along the route who are as eager to travel fast as those taken on at the starting terminus. Baggage, express matter and mails must also be taken at intermediate points. All this trenches on the time. An interval of from six to eight minutes must necessarily occur between stopping and starting, to say nothing of the greater time required for a long train to get under headway after a stop and to slow up preparatory to a stop. So many precious minutes are lost in this way that 60 or even 70 miles an hour between stations, or between the points at which full headway is attained and the points where the slowing up begins, is not sufficient to bring up the required maximum average. While the large engine may be capable of doing the actual work of getting

over the ground with its weight and length of train, it can not make up for the lost time, which, under these conditions, is constantly piling up against it.

As the remedy for this state of things is not to be found in an increased capacity of the existing type of engines, it must be looked for in a resort to expedients. On some lines the plan has been adopted of dividing trains, each section to be hauled by an engine of suitable capacity. This, of course, requires two engines, two crews, and two sets of train hands to do the work, instead of one. But the saving in time where time is so important is very considerable. Less time is consumed in slowing up and in getting under way, and the stops are shorter for the reason that a given number of people can leave or get on the shorter train quicker than they can with the longer one. The distance occupied on the track is only half as great, and there is less need for excessively fast running between stations. The two sections of a train need not be so far apart as to make any great difference to the passengers in the matter of time—not more than fifteen or twenty minutes at all events.

## A STANDARD FREIGHT CAR TRUCK.

The following question was the subject for discussion at the meeting of the New England Railroad Club, in Boston, on the evening of May 28:

"Is a standard *Freight Car Truck* possible, and if so, what are the features, in detail, of the most durable, as to style, sizes of iron and bolts, kind of springs, journal bearings, etc., etc.?"

At this present writing we do not know what was said on the subject, or what disposition was made of the preliminary question as to whether such a truck is "possible." This branch of the inquiry should first be decided, or else it would seem to be a waste of time to talk about details. From a layman's point of view, we should say most decidedly that such a truck *is* possible. To assert the contrary, would be the same as saying that the discussion which has been kept up for years has been a profitless one so far as a standard is concerned; and besides, it would be a reflection upon the skill and ability of railroad mechanics and managers. The possibility of the thing necessarily involves the designing of the truck, and its general use on the roads. These two things are certainly possible, in the sense of not being contrary to the nature of things, or impossible. This preliminary point being disposed of, the details must be grappled with; and here comes the tug. Before any real progress can be made with the details it would seem to be important to know about how much maximum weight the proposed standard is to carry. Is it possible to say what this weight shall be? It can be fixed arbitrarily at so many tons as a basis or gauge for determining the material, quality and pattern of every part of the structure. But if the weight to be carried is an unknown and variable quantity, dependent upon the undeveloped future exigencies of freight service, it is difficult to see how the details of the structure can be settled in advance of some definite knowledge as to how much work it will have to do. Better fix upon some figure to represent the total weight upon the eight journals, and then design and build a truck capable of carrying half of it. Such a truck would be a standard for that maximum weight, but whether a nominal or real standard must depend on the extent to which it is used.

## CAR COUPLINGS IN MASSACHUSETTS.

The Legislature of Massachusetts has enacted a law requiring that after March 1, 1885, all freight cars owned by the railroad companies of that State shall be equipped with such automatic or other safety-couplings as may be prescribed by the Board of Railroad Commissioners. This, as we understand the meaning of the law, compels the commission to designate what particular coupling or couplings shall be used. To do this, it will be necessary for the commission to test and examine a large number of coupling devices in order to determine their comparative merits and select the best. It comes to this at last. If the railroad companies themselves cannot agree as to which are the safest and most effective, the law will step in and compel *somebody* to agree about it, and then the roads will have to use whatever couplings are thus designated. This, at all events, is the present outlook in Massachusetts. The decision rests with the commission as to whether good, bad or indifferent couplings are to be used upon the cars owned by the railroad companies of the State after March next. It may be asked, Which are the best qualified by technical and mechanical knowledge for making such a decision, the members of the commission or a given number of railroad officers selected for the purpose? saying nothing about any improper influences that may be brought to bear in either case by interested parties to bias the judgment. The question admits of but one reply. But, in view of all the circumstances, the interminable and fruitless discussions and the appalling record of the killed and wounded in coupling cars, it cannot be said that there is any undue precipitation in the action of the Massachusetts Legislature. In the absence of legislative action, why should not the next ten or a dozen years be as barren of results as the same number of years has been in the past? The question has been raised whether a State Legislature can compel a railroad company to put any coupling whatever on its cars. But that is a point to be determined by the courts when the issue is duly brought before them.

The commissioners will give a hearing on the 25th of September to parties having safety-couplings to recommend, and also to parties who wish to criticise the same. A vast number of railroad men, inventors and trainmen will be interested in the hearing, mainly for the reason that it will be followed by a definite decision that will take legal effect nine months hence.

## JOURNAL FRICTION.

Some experiments have recently been made in England in regard to the friction of journal bearings, a report of which has been adopted by the Committee on Friction of the British Institution of Mechanical Engineers. These experiments throw some new light upon several points that have heretofore been somewhat obscure, although, in consequence of their having been made with apparatus very unlike that which is used in actual practice, some abnormal results have been obtained, from which conclusions may be drawn very different from what might have been had the apparatus conformed more nearly to practical requirements.

The experiments were made with bearings 4 inches in diameter and 6 inches long. The journal was of steel, and the bearings of gun metal, covering nearly half the journal. The first thing which was developed at all different from what might have been expected was, that the friction increased rapidly and was at times very much greater after the direction in which the shaft revolved was reversed. This increase was the greatest with a new brass bearing, but with an old one that was well worn, the difference upon reversing the motion was scarcely perceptible. Sometimes the reversal, in addition to an increase of friction, caused a strong tendency to heat and "seize." With the steel journal and brass bearing, the temperature was found to have a very marked effect upon the friction. At 450 revolutions per minute, the co-efficient of friction at a temperature of 120° F., was only one-third as much as at 60°, or in other words, the friction, in the ordinary sense of the term, was diminished one-third by increasing the temperature from 60 to 120.

Two sets of experiments were carried on, in one of which the journal was run in an oil bath, and it was found that the friction did not increase in direct proportion to the load as it should have done, according to the theory that the friction of solids moving in contact varies in that proportion, and independently of the area of surface. It is also held that such friction diminishes with the increase of velocity beyond a certain limit. The theory of liquid friction, however, or of a solid moving through a liquid, asserts that the friction is independent of the load per unit of surface, depending directly on the extent of surface, and increasing as the square of the velocity.

The experimenters came to the conclusion that the friction of a perfectly lubricated journal follows much more closely the laws applying to a vessel moving through the water than to one solid substance moving upon another. Interesting as this point is, and important as it seems to be for certain kinds of machinery, car and locomotive builders have little need to alter their theories, since locomotive and car journals rarely have anything like perfect lubrication. Some of the experiments showed that when the lubrication was perfect, the brass was actually floating on a film of oil which was forced with considerable pressure out of the oil holes made in the brass, a pressure gauge indicating in one case, when screwed into an oil hole, upward of 200 lbs. per square inch. The efforts to lubricate this bearing with a central hole communicating with grooves in the top of the box were highly unsatisfactory, and the record states that the oil was wiped from the brass and forced into the oil-hole until the brass and journal were entirely dry. Better success attended the use of grooves at the sides of the brass, and the introduction of oil at these points. In some cases, with loads of 178 lbs. per square inch of horizontal section, the oil feeders failed to work, and the brass "seized" in one case, with a load of only 200 lbs. per square inch. When the journal was oiled from below by means of a pad of waste or felt, the bearing was made to carry 551 lbs. per square inch. The friction under these circumstances was about $\frac{1}{100}$ part of the load.

This line of experiments, which was practically the same as that of ordinary lubrication, did not, according to the report, produce results worthy of record, because they were too irregular, and the final conclusion was that the friction depends upon the quantity and uniformity of oil distribution. The results obtained are no doubt exceedingly valuable, but unfortunately the conclusions reached are only applicable to this particular steel bearing with its bronze box fitted up so as to have no end play or motion, and to run quietly without shocks or jars or relief from the load. In other words, it ran with perfect steadiness.

It was thought possible by the experimenters, with speeds of from 100 to 200 feet per minute, and with a properly proportioned load, to reduce the friction to $\frac{1}{300}$ part of the load, which is probably obtained quite often in actual practice. Under light loads, rape and sperm oil proved to be the best lubricants and giving the least resistance. Mineral and lard oils followed in their order, the respective weights and frictional resistance being relatively in the same order, were found to stand at the head of the list, giving the least resistance. Mineral oil followed, with lard in the order named, and also in the same order were their weight and carrying powers.

One of the peculiar things which has attracted the attention of car builders, is the fact that it is possible to have a journal run cool and to have its friction increasing very rapidly at the same time. Some kinds of grease show these results in a most decided way, and although the resistance mounts up with great rapidity, the load can be increased and the journals kept cool at the same time.

## Master Mechanics' Association.

The following circular from the Secretary's office has been issued for the Committee of Arrangements for the Seventeenth Annual Convention:

"The Ocean Hotel has been selected as the headquarters of the Association during the approaching session of the Convention, to be held at Long Branch, N. J., commencing June 17, proximo. Accommodations for all members will be reserved on due notice being given.

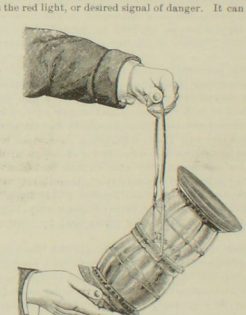
"Members intending to be present at the Convention are therefore requested to notify the undersigned as early as possible. Where members are to be accompanied by ladies special notice should be given.

"Address Wm. Woodcock, Master Mechanic, Philadelphia & Reading Railroad, Elizabethport, N. J."

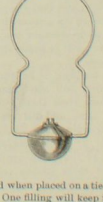
The Committee of Arrangements consists of Messrs. Wm. Woodcock, F. M. Wilder and H. D. Garrett.

## The Burrell Railway Signal Lantern.

This invention is for the use of trainmen, yardmen, gatemen, track-walkers and others who use lanterns. It has two globes of different colors joined together at the center by bayonet locks and catch. The handle passes through the center of the lantern and is attached firmly to the lamp, forming an axis upon which the lantern may revolve. Only the upper half of the lantern is illuminated, the lower half being darkened by the body of the lamp. The handle catches to the rim of the half that is uppermost. Thus if a white or clear light is showing, and it is necessary that a signal of danger, or red light be instantly given, a revolution of the lantern (which can be made in less than one second) gives the red light, or desired signal of danger. It can also take



the place of two lanterns and saves one-half the oil, wicking, cleaning, breakage, and cost of repair. Trainmen need not be burdened with so many lanterns. Gatemen need not keep two lanterns burning all night in case of accident—one burning inside their box and one outside; this one takes the place of both. For station-agents it is convenient, and for track-walkers on large railroads it is a reliable safeguard. A danger signal may be given with an ordinary white lantern, but an engineer, accustomed as he is to seeing white lights moving upon and in the vicinity of the track, might not notice a danger signal given with a white light. It certainly would not catch his eye so quickly as a red light. It also has the further advantage



of being more elevated when placed on a tie or on the ground than an ordinary lantern. One filling will keep it burning from 20 to 23 hours. It can be easily cleaned, and may be used by a disabled gateman—a one-armed man can change it from a white to a red light in less than two seconds. The globes are manufactured in white (clear glass) and red (ruby), or ruby and green, or any two colors desired, and are removable and interchangeable. Manufactured by the Metzler Railway Signal Lantern Co., 4948 Germantown avenue, Philadelphia, Pa.

THE SMITH EXHAUST FAN AND PRESSURE BLOWER.

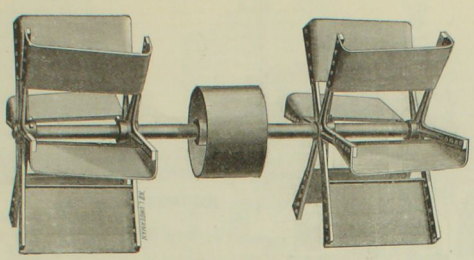


Fig. 1.—Double Exhauts Wheels.

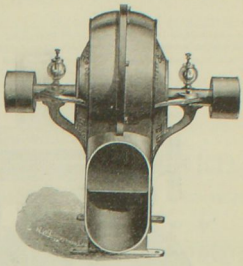


Fig. 3.—Front View of Blower.

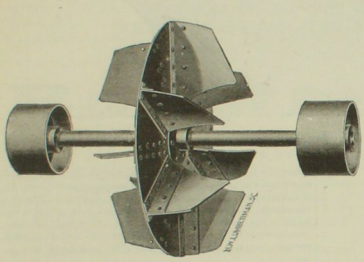


Fig. 2.

Pressure Blower Wheel.

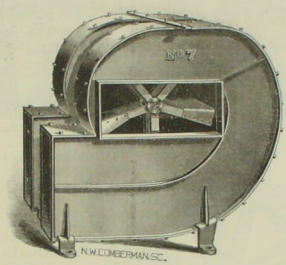



Fig. 4.

Side View of Double Exhauster.

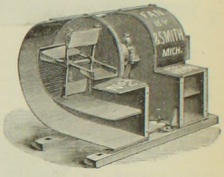



Fig. 5.

Double Exhauster with Side Removed.

The cuts illustrate a new form of pressure blower and exhaust fan manufactured by The Huyett & Smith Manufacturing Co., of Detroit, Mich. In its construction there are some new and novel features, which, in connection with the unusual claims made in respect to its performance, entitle it to the attention of all users of this class of machinery.

The fan is a marked departure from the ordinary types, both in the form of the wheel and in the shape and construction of the case. The peculiarities of the fans and exhausters are shown in the cuts. The case differs from those in common use by having two for each wheel, one of which is in front in the usual position, and the other in the rear near the top. The discharge from the latter is carried out radially and then brought around the case to the front, where it discharges under the front opening, which occupies the usual position. This gives the peculiar form to the case as shown in Fig. 4, which is a side view of a double exhaust fan. The spiral rib on the side of the case shows the position of the division plate between the two outlets. The radial rib, starting from the upper corner of the rectangular spring, indicates the point at which the upper and back discharge takes place.

In Fig. 5, the double exhaust fan is shown with one of the sides removed, but with the partition in place so that the relation of the two points at which the fan discharges and the course taken by the air in passing from the back of the wheel to the front is readily seen. The object in increasing the number of the outlets is to get from the same wheel a larger amount of work than can be obtained from a wheel with one opening. According to this plan, as soon as the blade passes the cut-off, instead of meeting with a resistance from the compression until it reaches the starting point, it is relieved twice during each complete revolution; the principle being somewhat analogous to that which gives a gullet to the tooth of a circular saw in order to provide a space for the sawdust until it has an opportunity to escape. It is claimed that each one of the outlets discharges a volume of air of the whole width of the fan and equal to one-third of its diameter. This makes the total discharge equal to two-thirds the diameter and the whole width of the fan.

Fig 3 is a front view of a cupola or forge-blower, and shows the position of the double discharge outlet. This style has a single wheel and is driven by double belts. The double fans all have a fan upon each shaft and a pulley in the center between the cases, carrying a single belt.

The fans are quite as peculiar in form as are the cases. Fig. 1 shows a pair of these fans used for a double exhauster. They consist of malleable iron spiders to which are riveted sheet steel blades or buckets of a spread U-shaped section and scoop form, and as the spiders are not set fair with each other, the blades are all brought upon a skew. The turning up of the ends of the blades is for the purpose of securing a more effective cut-off than could be obtained by a plain flat blade.

In the single forge and pressure blower, the form of wheel shown in Fig. 2 is used. This has a central steel disc, ground and polished, to which the steel blades are riveted, the disc being designed to prevent the currents of air which enter the wheel from opposite directions from meeting each other and causing an unnecessary resistance to their entrance. The blades are staggered upon the disc so as to give as uniform a delivery of air as possible, and distribute the vibration caused by the blades passing the cut-offs. Blowers of this kind are intended to give a blast of from 12 to 16 ounces.

An important advantage which is gained by these forms for blowers is the diminution in size for a given amount of work and the consequent reduction of power needed to perform it. Engineers have long recognized the ordinary forms of fans as exceedingly wasteful of power, and they are tolerated only on account of their cheapness and the small space occupied by them. The value then of an invention, which while reducing by one-third the space required for a fan, at the same time calls for less power than is commonly needed, will at once be appreciated.

The new form of exhaust fan has many very desirable features for wood-working machinery. It can be had single, both right and left hand, to stand upon the floor or hung from beams. It can also be had double to hang from the floor timbers, sit upon a floor or bolt up to a wall. The great power of these fans makes them valuable in handling heavy or wet shavings or emery dust, which is especially hard to manage. In moving shavings, these exhausters are capable of doing the heaviest and most difficul work with ease, and the above-named company undertake and guarantee work of this kind on any scale that may be desired.

The two fans which are on one shaft may be piped separately or together, and while one is used for removing shavings or sawdust, the other may be piped to furnish hot air to dry houses, blow forges, or for any purpose where the air may be needed.

## Our Directory.

We note the following changes since our last issue. Our readers will do us a great favor by giving us prompt notice of any changes that may come to their knowledge or of any errors that may be noticed in our list.

*Atchison, Topeka & Santa Fe.*—C. M. Rathburn, heretofore Assistant Superintendent of the Eastern Division, has been appointed Superintendent of the Western Division, in place of D. H. Rhodes, resigned.

*Brunswick & Western.*—Richard J. Evans has been appointed Superintendent and Assistant Chief Engineer.

*Buffalo, New York & Philadelphia.*—The lines of this company are now operated in three divisions: Buffalo Div., Henry Dwyer Superintendent; Rochester Div., J. W. Watson Superintendent; Pittsburgh Div., E. H. Witter Superintendent.

*California Southern.*—J. M. Keith has been appointed Master Mechanic, vice C. Berkley Powell, who has gone to the Old Colony, of Mass.

*Central Iowa.*—The car and machinery departments have been consolidated, and will be under the superintendence of John Player, the Master Mechanic of the road.

*Chesapeake, Ohio & Southwestern.*—D. C. W. Brown has resigned the position of General Superintendent. The office of Supt. of Machinery and Motive Power has been removed to Paducah, Ky.

*Chicago & Grand Trunk.*—S. R. Callaway has resigned as General Manager, to accept a position on the Union Pacific.

*Cincinnati, New Orleans & Texas Pacific.*—J. L. Tomlinson is Asst. Supt. of Motive Power, at Ludlow, Ky., in place of L. W. Fowle, who is Master Mechanic of the New Orleans & Northeastern, at Meridian, Mass.

*Eastern.*—Arthur M. Waitt has been appointed General Foreman of Car Department, in place of J. D. Billings.

*Houston & Texas Central.*—E. L. Larcher has resigned the position of Purchasing Agent.

*Lake Shore & Michigan Southern.*—L. G. Higgins has been appointed Purchasing Agent in place of A. C. Armstrong, resigned.

*Louisville, Evansville & St. Louis.*—F. P. Boatman has been appointed Master Mechanic, vice N. Sceets, resigned.

*Louisville, New Albany & Chicago.*—The offices of division superintendents of the Northern and Southern Divisions have been abolished, and C. C. F. Bent is appointed Superintendent of Transportation for the whole line.

*Memphis & Little Rock.*—Rudolph Fink has been appointed Receiver, and also assumes the duties of General Manager and Purchasing Agent.

*Michigan Central.*—Robert Miller, who has been Master Car-Builder of the road for a number of years, has been appointed Assistant General Superintendent.

*New York, Philadelphia & Norfolk.*—James McConkey has been appointed Superintendent, vice J. L. Bates.

*North Pacific Coast.*—E. L. Reese has been appointed Master Mechanic, with office at Saucelito, Cal., in place of J. Taylor, resigned.

*Northern Pacific.*—John C. Barber is appointed Assistant Superintendent of Motive Power, Machinery and Rolling Stock, with the title of Master Car-Builder.

*Ohio & Mississippi.*—John Thumser having resigned as Division Master Mechanic at Seymour, Ind., the jurisdiction of Arthur Donaldson, Div. M. M. at Vincennes, is extended over the East & Louisville Div. as Acting Master Mechanic.

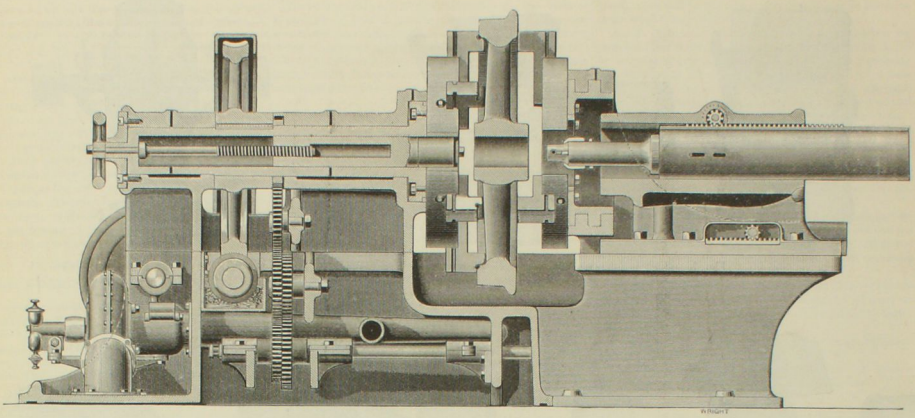
*Old Colony.*—J. N. Lauder, in addition to his duties as Supt. of Motive Power, will have charge of the cars and car shops of the company, with the title of Superintendent of Rolling Stock. Samuel Stevens is Supervisor of Bridges and Buildings.

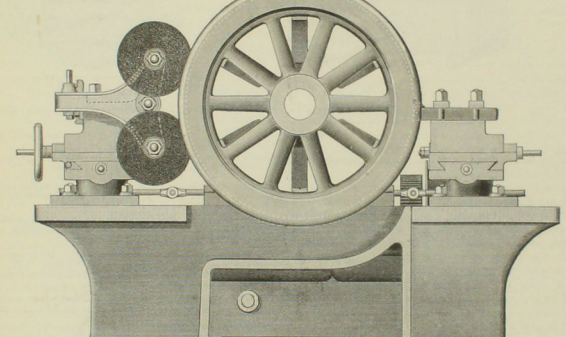
*Saginaw, Tuscola & Huron.*—C. S. McMillan has resigned his position as Superintendent of this road.

---

ROBERT CLARKE & CO., of Cincinnati, O., have issued an extensive catalogue (Part II.), of American and foreign books relating to Applied Science, embracing Mining, Metallurgy, Stereotyping, Assaying, Industrial Chemistry, Coal, Petroleum, Electricity, Telegraphy, etc., etc. Copies will be sent to any address on application to the publishers as above.

THE GOWAN CAR WHEEL CENTERING, BORING AND TRUING MACHINE.





The machine represented in the engravings is now in successful operation, and was constructed with the view of overcoming, if possible, every objection in the construction and manipulation of car wheels. With scarcely any class of these wheels has the attempt to produce a true wheel been successful. Chilled wheels, as they are turned out by the makers, are very defective, and after being operated upon by machines, over fifty per cent. are so located and bored that they run out at perimeter double the defect in casting. They are also found far from being true at wearing side of flange. Standard 33-inch wheels, cast in the best manner, allowing an average of $\frac{1}{16}$ inch variation from a true disk, will, when controlled for boring in the ordinary mill, invariably be eccentric $\frac{1}{4}$ inch when secured to their axles.

Assuming two wheels, measured in circumference in the rough, and being of exact size, we term them a pair. They are bored out and pressed upon their axles. By indicating same on centres, we find one of the pair true at periphery, less $\frac{1}{16}$ inch, or probably less, while its mate is found to register $\frac{1}{16}$ inch from being true. The only resort is to cut away $\frac{1}{16}$ inch from one side of the worst wheel, equal in time to reducing such wheel $\frac{1}{8}$ inch. This necessarily warrants cutting away the best wearing surface from the best bored and cast wheel in order to make it conform in size to its mate, if both wheels comprising a pair should be true in every particular, which is of vital importance to ease of motion, mileage, safety and permanent way.

This trouble is easily accounted for when we trace first the condition of only two wheels, one $\frac{1}{16}$ inch and its fellow $\frac{1}{16}$ inch defective, convinced the boring-bar and contact points of chuck-jaws are absolutely true, while the object secured for boring is not true, consequently cannot be located, still invariably the best cast wheel will undoubtedly be bored more concentric; the more defective the casting, the greater will be the eccentricity when bored.

In the first place, no wheel can be controlled and bored absolutely true in a three-jaw chuck acting in unison; four independent acting jaws overcomes the evil, but evidently much slower than the former, as time is consumed to set the wheel, and may be well spent. Six-jaw chucks, or rather six contact points, have been thoroughly tested under all conditions; the result was far more satisfactory than three, and controlled the wheels in some cases, but not all, which can easily be demonstrated by placing a wheel $\frac{1}{16}$ inch defective on three pieces of wood high enough for wheel to clear jaws, so that the latter may move without disturbing the wheel; set the long sides of wheel equal distances from boring-bar, also the narrow sides. This being done, place two clamps on the wheel, securing it in position absolutely true with long and narrow sides; then locate four points at right angles of equal distances from the tread, set up jaws lightly, and when touching tread examine all the jaws and it will be found one bearing only, still the wheel is perfectly set; retaining the correct measurement, remove clamps, tighten up jaws, refer again to the points of location; it will readily be discovered the wheel has moved considerably from its correct position, fully double what the wheel was defective.

Touching upon the six universal contact points, it will also be seen it does not overcome all irregularities. In some cases wheels indicate fully one-half their circumference to a radial line, the remaining half partly above and partly below such line; therefore this defect cannot be overcome. The rapid and correct method is: Three jaws universal, and three jaws independent acting; the former three approximately locates the wheel, the three independent and alternately arranged jaws equalize to a nicety any defects connected therewith. Resorting to such a method, it takes about two minutes, then we call the wheel perfectly set; it takes just twelve minutes to reduce such wheels to a perfect disk, boring included; handling, setting, grinding and boring, fifteen minutes each, an average of 33 chilled wheels 33 inches diameter finished in ten hours. By this means the least possible and only peripheral defects are removed, the next wheel operated upon, if larger or smaller, instead of being on the axle and the best wearing surface removed therefrom, can be restored to it, being mated with ones of similar size. The little time consumed in properly locating such wheels is compensated eight to one in each case; as proof, 35 wheels bored, ground and paired in ten hours, or about 18,142 surface inches, which is remarkable on such material. This could not be accomplished were it not for the crystal used in operation, which is the result of continued experiments. Another great advantage in handling wheels in this manner, is the absolute setting if chilled wheels are only to be bored and not relieved of peripheral irregularities. In this case it will do more correct work, and as much as any mill will do, less the setting. In every wheel the flanges are true as cast and bored correct with every wearing surface. If the wheels are cast carefully they will be located true at inner side of ring. This virtually balances the wheel as near as its construction will permit.

Referring to steel, or steel-tired wheels, this tool is specially adapted to such for turning off rapidly. The surplus metal being held close to the tool, a cut $\frac{3}{8}$ inch can be had with ease without the least vibration; so complete is the working that at the same time such a cut is actuating on one side, the abrading wheels automatically follow the tool, finishing the tread; so really only one cut is taken across the face. Four wheels of equal conditions can be done in this machine, while two are finished on the axle, as all familiar with the operation of such tools know the contention with large wheels on a yielding axle, let the lathe be ever so strong. This tool cannot be surpassed in any steel wheel works or repair shop, as the latter has many wheels to mate up with ones of similar size, saving much of the tire; it is not necessary to rebore, as they can be set absolutely true with the already bored axle seat.

The machine above referred to meets every condition of wheel, including 42-inch wheels. The work, when leaving this machine, is complete for the wheel-press and road. It will be offered to railway companies and wheel-makers under an absolute guarantee as to performance. It will be composed of and finished as a high class tool in every sense of the term. For further particulars, price, etc., please address the Gowan Car-Wheel Tool Company, Chicago, Ill.

---

THE Great Western Railroad Supply Company, East St. Louis, has been incorporated; capital stock, $500,000; to manufacture and deal in all kinds of railroad castings, engines and machinery and general repairs; incorporators, James H. McLean, William Jackson and John Wilson.

---

THE firm of S. C. Forsaith & Co., machinists and general machinery dealers, Manchester, New Hampshire, was incorporated May 1, under the laws of the State of New Hampshire as The S. C. Forsaith Machine Company, with a capital stock all paid in of $275,000, for the purpose of manufacturing and dealing in machinery and supplies. The officers will consist of D. B. Varney, president; S. C. Forsaith, treasurer, and W. F. Drew, agent, the management being the same as in the past. The firm to which the new company succeeds was established in 1860, the object of incorporation being to still further increase the business, placing it upon a still broader basis than in the past, while the works and office will remain as in the past at Manchester, N. H.

---

WANTED.—A position in a railroad car shop by a practical mechanic and competent draughtsman of long experience. Can construct and improve all kinds of cars and car trucks. Recommendations from present employers furnished. Address F. H. G., NATIONAL CAR-BUILDER, Morse Building, New York.

---

FOR SALE.—Two first-class models of cars, two feet long, with several feet of track for each. Workmanship of the best quality; metallic parts triple silver-plated, the two costing over $300. Will be sold cheap. Apply to NATIONAL CAR-BUILDER, Morse Building, New York.

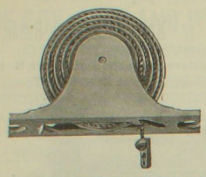
---

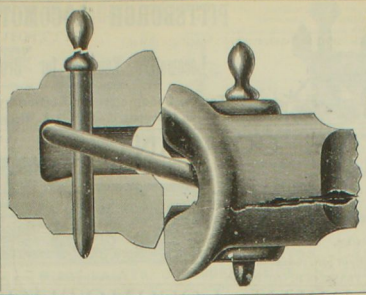
## CAR SHOP MACHINERY FOR SALE.

THE FITCHBURG RAILROAD COMPANY offer for sale one second-hand Car Wheel Borer, a good, strong machine, will do excellent work, can be used for splinning. Also, one second-hand Car Wheel Screw Press, capacity 100 tons.

These machines are suitable for small Car Shops, one in good order and ready for use. For terms, address F. S. Pratt, Purchasing Agent, Fitchburg R. R., Boston, Mass.

## "CAR WINDOW BALANCE."





For Passenger Coaches, Sleeping and Parlor Car Windows, consisting of Cone and Coil Spring with wire cord balancing the weight of sash; noiseless in operation and placed entirely out of sight. Adopted by many of the leading roads. No car complete without them.

**O. K. GARDNER, Manufacturer,**
**28 and Railroad Sts., Pittsburgh, Pa.**

## SAFFORD'S SAFETY DRAW-BAR

"VICTORY OVER MORE THAN 30 CONTESTANTS."

Victory over more than 30 Self-Couplers in the Master Car-Builder's Convention of June, 1870. Also indorsement for safety in coupling by the Yar Masters, in their Convention, June, 1877, and by 300 others who were unab to attend the Convention, and 300 railroad officials who are resident in 2 States, and who admitted superiority over any other yet produced. Try 30 free of royalty, and see for yourself! Pattern free, and no change in timbers or connections. Those made by Wilson, Walker & Co., Pittsburgh, Pa., *will save 200 per cent. in repairs*, and give double life service over *old styles of* wrought iron. About 43,000 in use by 146 railroads. The *saving in repairs* by using *my invention* is from 20 per cent. to 80 per cent. as per *report of many officers.*

J. B. SAFFORD,
EAGLE IRON WORKS
**BUFFALO, N. Y.**

# WOLFRATH'S COMBINATION SASH LIFT AND AUTOMATIC FASTENER.

**Sash can be raised or lowered to any desirable height. Cannot drop. Approved and adopted by practical Railroad men.**

Address, **NEW YORK CAR FITTINGS CO., 82 DREXEL BUILDING, NEW YORK CITY.**

## JOHN W. MASURY & SON,

MAKERS OF STRICTLY FIRST-CLASS

# Railway Varnishes,

AND MANUFACTURERS OF

**CAR BODY COLORS.**

By permission, we refer to the following Companies, for whom we have made Special Colors:

PENNSYLVANIA RAILROAD CO., Enoch Lewis, Purchasing Agent, Philadelphia, Pa.
PENNSYLVANIA CO., Wm. Mullins, General Purchasing Agent, Pittsburg, Pa.
BALTIMORE & OHIO RAILROAD CO., N. S. Hill, Purchasing Agent, Baltimore Md.
CHICAGO & ALTON RAILROAD CO., A. V. Barwell, Purchasing Agent, Chicago, Ill.
CHICAGO & NORTHWESTERN RAILROAD CO., R. W. Hamer, Purchasing Agent, Chicago, Ill.
LEHIGH VALLEY RAILROAD CO., L. Chamberlin, Purchasing Agent, Philadelphia, Pa.
NORTHERN RAILROAD OF CANADA, F. W. Cumberland, Superintendent, Toronto, Ont.
NAUGATUCK RAILROAD CO., G. W. Beach, Superintendent, Waterbury, Conn.
PHILADELPHIA, WILMINGTON & BALTIMORE RAILROAD CO., S. A. Hodgman, Superintendent of Motive Power, Wilmington, Del.
NEW YORK, NEW HAVEN & HARTFORD RAILROAD CO., R. N. Dowd, Commissary, New Haven, Conn.
UNION PACIFIC RAILROAD CO., A. D. Clark, Purchasing Agent, Omaha, Neb.
KANSAS CHICAGO, BURLINGTON & QUINCY RAILROAD CO., Wm. Irving, Purchasing Agent Chicago, Ill.
LOUISVILLE, CINCINNATI & LEXINGTON RAILROAD CO., Wm. Mahl, Purchasing Agent, Louisville, Ky
GRAND TRUNK RAILWAY N. Wall, Port Huron, Mich.
LITTLE ROCK & FORT SMITH RAILROAD CO., T. Hartman, Purchasing Agent, Little Rock, Ark.
GILBERT & BUSH CO., Troy, N. Y.
WASON MANUFACTURING CO., Brightwood, Mass.
BILLMEYER & SMALL MANUFACTURING CO., York, Pa. } Railroad Car Builders.
JACKSON & SHARP CO., Wilmington, Del.
BARNEY & SMITH MANUFACTURING CO., Dayton, O.

The advantages derived from the use of such Special Colors are many, a few of which are found below:
**ABSOLUTE UNIFORMITY OF SHADE. DURABILITY,** as we use perfectly pure materials. **SAVING OF MONEY,** because of small quantity required. **SAVING OF TIME,** in the putting on of the same. **SAVING OF LABOR AND MATERIAL,** as no extra amount of Varnish will be required to hide a sanded surface. **LARGER DEGREE OF CERTAINTY** that there will be an absence of cracked work, as our mixtures are all uniform, being done by weight only.
We make any desired shade, it only being necessary that purchasers furnish us with sample of color desired, stating the time they would like to have the paint dry in.
We shall be glad to furnish samples and give prices to any who may wish to avail themselves of the above advantages.
Very respectfully,

JOHN W. MASURY & SON, New York and Chicago.

## Established 1856.

# Shipman & Bolen, Manufacturers of fine Railway Varnishes,

## No. 352 Mulberry St., Newark, New Jersey.

# BILLINGS, TAYLOR & CO.,

(INCORPORATED.)

# Color Makers,

AND MANUFACTURERS OF

## COACH AND CAR COLORS AND FINE VARNISHES.

N. Y. Office, 105 John Street. CLEVELAND, OHIO.

# MALLEABLE IRON CASTINGS

AIR FURNACE IRON SEAT-ENDS, SLEEVE NUTS, JOURNAL WEDGES, OIL-BOX COVERS, SEAT-BACK ARMS, Fr'Car Fastenings, DRAW-BARS, Etc., TO ORDER.

**DAYTON MALLEABLE IRON CO.** DAYTON, O.

## CLEVELAND, COLUMBUS, CINCINNATI & INDIANAPOLIS RAILWAY.

Evening trains leave CLEVELAND daily with Reindeia Sleeping Cars for COLUMBUS, CINCINNATI, INDIANAPOLIS, LOUISVILLE, TERRE HAUTE, EVANSVILLE, ST. LOUIS and all points West and South. Morning trains leave Daily, except Sunday, with Through Palace Coaches, for COLUMBUS, CINCINNATI, INDIANAPOLIS, LOUISVILLE, and ST. LOUIS without change. This is the only line making direct communication with all the Principal Trunk Lines of the East for NASHVILLE, MEMPHIS, NEW ORLEANS and all points in Texas, either by way of LOUISVILLE or ST. LOUIS. Direct connection at ST. LOUIS for all Railway Towns in Kansas, Nebraska and Colorado.
**Equipment Comprises all Valuable Improvements.**
THE BEST ROAD-BED AND SAFEST ROAD IN THE WEST.
E. B. THOMAS, General Manager. A. J. SMITH, General Ticket Agent.

## THE EGAN COMPANY,

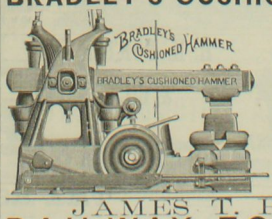
Successors to the Cordeman & Egan Co.,
MANUFACTURERS OF THE
Most Improved and Patented **WOOD-WORKING MACHINERY,**
**Nos. 234 to 250 WEST FRONT STREET, CINCINNATI, O., U. S. A.**

## CAR-BUILDERS' DICTIONARY.

*Compiled for the Master Car-Builders' Association by* M. N. FORNEY, *assisted by* LEANDER GAREY *and* CALVIN A. SMITH.

It contains an alphabetical list of about 2,500 words and their definitions, covering 188 pages and 800 engravings, which occupy 200 pages more, the whole book having 400 pages. A large proportion of the engravings are made to a scale and illustrate all the different parts of railroad cars, and nearly all kinds of railroad cars in use in this country, forming the most complete collection of illustrations of the subject ever published, and being the only book on American railroad cars in existence. 800 engravings, 400 pages; size, 5¼ × 8 inches. Price, $2. Address, CAR-BUILDER, New York.

## BRADLEY'S CUSHIONED HAMMER




STANDS TO-DAY
WITHOUT AN EQUAL.
OVER 800 IN USE.

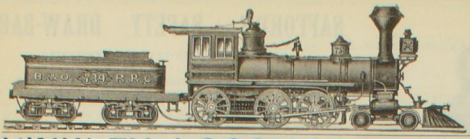
It approaches nearer the action of th smith's arm than any hammer in the world.

BRADLEY & CO.,
Syracuse, - - N. Y.
(Established 1832.)

Heating Forges for Hard Coal or Coke.

## JAMES T. PATTEN,
## RAILWAY EQUIPMENT.

REPRESENTING THE
Wason Mfg. Co., of Springfield, Mass. RAILWAY CARS, ETC.
Portland Company, of Portland, Me. LOCOMOTIVES.
18 BROADWAY (Welles Building), NEW YORK.



## PITTSBURGH LOCOMOTIVE AND CAR WORKS,

PITTSBURGH, PA.

MANUFACTURERS OF

Locomotive Engines for Broad or Narrow Gauge Roads,

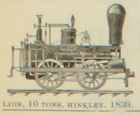
From standard designs, or according to specifications, to suit purchasers.

Tanks, Locomotive or Stationary Boilers Furnished at Short Notice

D. A. Stewart, Prest. D. A. Wightman, Supt. Wilson Miller, Sec. & Treas.

## HINKLEY LOCOMOTIVE COMPANY,

BOSTON, MASS.,

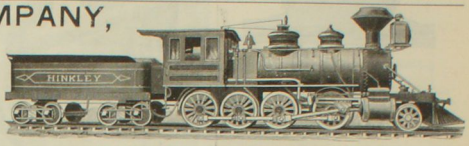


MANUFACTURERS OF

LOCOMOTIVE ENGINES

FOR ALL GAUGES.

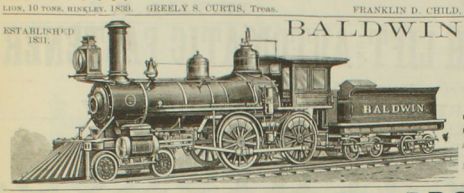
Best workmanship and interchangeability of parts guaranteed.



LION, 10 TONS, HINKLEY, 1839. GREELY S. CURTIS, Treas. FRANKLIN D. CHILD, Supt. CONSOLIDATION, 50 TONS, HINKLEY LOCOMOTIVE COMPANY, 1882.

## BALDWIN LOCOMOTIVE WORKS,

ESTABLISHED 1831.



PHILADELPHIA, PA.

BURNHAM, PARRY, WILLIAMS & CO., PROPRIETORS,

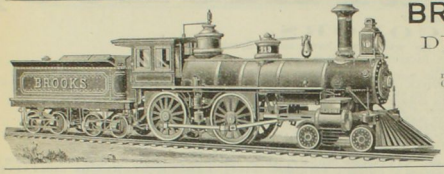
GEO. BURNHAM, CHAS. T. PARRY, EDWARD H. WILLIAMS, } MANUFACTURERS OF { WM. P. HENSZEY, EDW. LONGSTRETH, JOHN H. CONVERSE.

LOCOMOTIVE ENGINES, } CAPACITY 600.

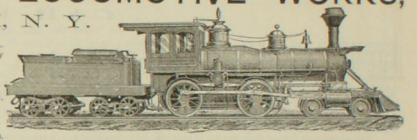
Adapted to every variety of service, and built accurately to standard gauges and templates. Like parts of different engines of same class perfectly interchangeable.

Passenger and Freight Locomotives, Mine Locomotives, Narrow Gauge Locomotives, Steam Street Cars, etc. Illustrated Catalogues furnished on application of customers. All work thoroughly guaranteed.

## BROOKS LOCOMOTIVE WORKS,



DUNKIRK, N. Y.

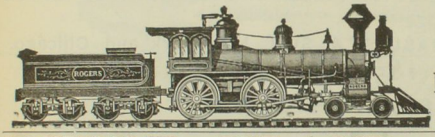


Orders Solicited for Locomotives Adapted for Every Class of Railway Service.

H. G. BROOKS, Pres't and Supt.

M. L. HINMAN, Sec'y and Treas.

## ROGERS LOCOMOTIVE AND MACHINE WORKS,



PATERSON, N. J.

New York Office, 44 Exchange Place.

Manufacturers of Locomotive Engines and Tenders and other Railroad Machinery

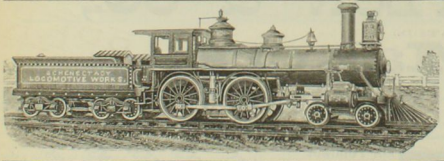
J. S. ROGERS, President. R. S. HUGHES, Secretary. WM. S. HUDSON, Sup't. } PATERSON, N. J.

R. S. HUGHES, Treas., 44 Exchange Place, New York.

# RHODE ISLAND LOCOMOTIVE WORKS,

## PROVIDENCE, RHODE ISLAND.

EARL PHILIP MASON, Vice-President. CHARLES FELIX MASON, President. ARTHUR LIVINGSTON MASON, Secretary.
WILLIAM P. CHAPIN, Treasurer. JOSEPH LYTHGOE, Superintendent. WILLIAM H. FENNER, Jr., Agent.

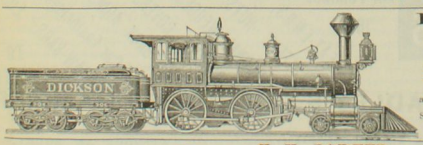


## SCHENECTADY LOCOMOTIVE WORKS.

CHAS. G. ELLIS, President. EDWARD ELLIS, Treasurer.

WALTER McQUEEN, Vice-President

SCHENECTADY, N. Y.



## DICKSON MANUFACTURING CO.

Scranton and Wilkes-Barre, Pa.,

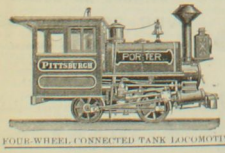
MANUFACTURERS OF

LOCOMOTIVES FOR EVERY KIND OF SERVICE.

The different classes constructed according to standard gauges and templets, so that like parts are interchangeable and may be ordered by number.

MINING, HOISTING and PUMPING MACHINERY a specialty. Car Wheels, Forgings, and Machinery of all kinds. Specifications and plans furnished on application. General Office, Scranton, Pa.

H. M. BOIES, President. JAS. P. DICKSON, Vice-President. WM. H. PERKINS, Sec'y and Treas.
E. D. LEAVITT, Jr., M. E., Cambridgeport, Mass., Consulting Engineer.



FOUR-WHEEL CONNECTED TANK LOCOMOTIVE.

## H. K. PORTER & CO.,

PITTSBURGH PA.

LOGGING LOCOMOTIVE

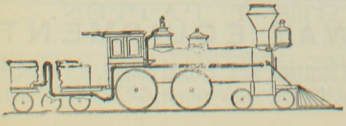
Builders of all Kinds of

LIGHT

Locomotives.

Send for Catalogue.

SHIFTING LOCOMOTIVE.



## THE ASHTON VALVE COMPANY,

271 Franklin Street, Boston, Mass.

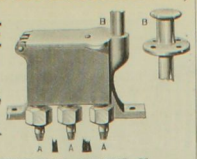
The Ashton Blow-back Safety-valve is constructed so as to conduct the escape steam which is blown off back to the tender, or to the smoke box and up the chimney. By this arrangement the heat of the escape steam, instead of being wasted as it is when an ordinary safety-valve blows off, is communicated to the cold water in the tender. This not only results in an important economy, but it renders the escaping steam noiseless, and the increase of temperature of the water has a tendency to deposit some of its impurities before it is pumped into the boiler. It thus *stops the noise, saves fuel, and all engines steam better and faster, and do more effective work with these valves* than with those in ordinary use.

## Campbell's Automatic Oiler for Locomotives,

FOR OILING AUTOMATICALLY

## THE BOX, SHOE AND WEDGE

OF LOCOMOTIVES.




L. B. FLANDERS MACHINE WORKS,
PEDRICK & AYER, Proprietors.
1025 Hamilton Street, Philadelphia, Pa.
CIRCULARS AND PRICES ON APPLICATION.

☞ WE REFER, BY PERMISSION, TO THE PENNSYLVANIA RAILROAD CO.

OFFICE OF FIRE MARSHAL, CINCINNATI, O., Feb. 28, 1884.

The Cincinnati Corrugating Co., Cincinnati, Ohio:

GENTLEMEN—My experience fully sustains the justice of the fire laws of Cincinnati and the usage of the Insurance Companies doing business in our City, viz.: In ranking CORRUGATED SHEET IRON with Brick or Stone for practical efficiency against fire.

Yours truly,

(Signed), JOSEPH BUNKER,
Fire Marshal.

## FULTON IRON AND ENGINE WORKS,

DETROIT, MICH.

## HOPKINS' BEARINGS

LEAD LINED

CLAMER'S AJAX JOURNAL METAL.

FULTON'S SPECIAL BRONZE BOXES, FOR PASSENGER CARS.

Bronze Journal Metal, for Freight Cars.

JAMES MCMILLAN, President. J. B. WAYNE, Vice-President and Manager HUGH MCMILLAN, Secretary.

TRADE MARKS:

"Phosphor-Bronze."

## PHOSPHOR-BRONZE,

For Bearings of Locomotives, Cars and Machinery,

SLIDE VALVES, CYLINDER RINGS AND STEAM CONNECTIONS.

SAVES OIL AND REPAIRS, PREVENTS DELAY TO TRAINS, AND NEVER CUTS THE JOURNALS.

Pamphlets and particulars on application to

"THE PHOSPHOR-BRONZE SMELTING CO., Limited,
Office, 512 Arch Street, Philadelphia, Pa.

Owners of the United States Phosphor-Bronze Patents. Sole Manufacturers of Phosphor-Bronze in the United States

## THE HENRY-BELL PAINT REMOVER!

FULLY TESTED.

Time, Money and Danger Saved to Railroads and Coach Painters.

For removing old Paint or Varnish from Woodwork, Iron, Glass, etc., *without the use of Fire, Hot Irons, or Scrapers.* Does its work *neat, cheap and rapid. Does not raise the grain of the wood or injure the fabric operated upon. Does its work in less than an hour, 60 minutes.* Can be repainted at once as nicely and effectually as when originally primed. Does away with the use of *Fire, Hot Irons or Scrapers.* Does not injure the workman. Applied with an ordinary paint brush upon any surface which can be painted. Will not run. After old paint is softened it is easily removed by water. One gallon of compound will remove all the paint or varnish on a square (10 × 10 feet). Price list sent on application. Reasonable discount to the trade. Orders, correspondence and tests solicited. Manufactured and sold only by

BELL & HENRY, Platteville, Wisconsin, U. S. A.

## EAMES VACUUM BRAKE CO.

## RAILWAY TRAIN POWER BRAKES

BEST IN THE WORLD.

WATERTOWN, NEW YORK.

THE EAMES BRAKE is confidently offered as the most efficient, simple durable and the cheapest power Brake in the market. Can be seen in operation upon over 120 roads, and notably the N. Y. Elevated R.R., where it daily makes 69,277 stops.

## DAMASCUS BRONZE,

Formerly Manufactured by the WESTINGHOUSE MACHINE CO., now made exclusively by the Damascus Bronze Company for BEARINGS for Locomotives, Cars and Machinery.

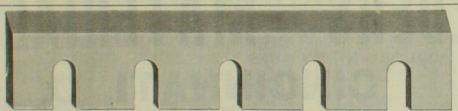
We would call the attention of Master Mechanics and Master Car-Builders to our

PEERLESS BEARING METAL,

Claiming it to have more Anti-Friction qualities and to be more durable than any Bronze or Brass on the Market.

The Metal is for Sale Either in Ingot or Castings.

## DAMASCUS BRONZE COMPANY, PITTSBURGH, PA.



Est. 1837. L. & I. J. WHITE. Est. 1837

Manufacturers of MACHINE KNIVES, PLANING, TENONING, Etc.

All Kinds Machine Cutters to Pattern. BUFFALO, NEW YORK.

## LLOYD & LINDSAY,

328 WALNUT STREET, PHILADELPHIA.

## Rolling Stock New and Second Hand.

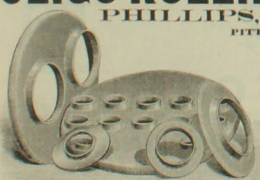
Steel Rails and Fastenings. General Line Equipments.
Iron Ship and Bridge Building Materials.
Steel Boiler, Bridge and Ship Plates. Angles and Beams.

## SLIGO ROLLING MILLS,

PHILLIPS, NIMICK & CO.,

PITTSBURGH, PA.,

MANUFACTURERS OF



"Sligo" Boiler Plate and Fire-Box Iron.

"Sligo" Bar, Band, Sheet and Angle Iron.

"Sligo" Stay Bolt Iron,

Used by the Principal Railroads in the United States, and Warranted Unexcelled.

"TYRONE" BRAND BAR, SHEET, TANK PLATE & ANGLE IRON.

Quality our Specialty.

BOILER HEADS AND FLUE HOLES FLANGED TO ORDER.

SEND FOR PRICE-LIST.

## ANSONIA BRASS AND COPPER CO.,

MANUFACTURERS OF

PURE COPPER WIRE

FOR ELECTRICAL PURPOSES, BARE AND COVERED

SEAMLESS BRASS & COPPER TUBING.

SHEETS, BOLTS, RODS, WIRE, Etc., IN

BRASS AND COPPER

W. E. DODGE, Jr., Pres.
G. P. COWLES, Vice-Pres. & Treas.
A. A. COWLES, Sec'y.

ANSONIA

REFINED INGOT COPPER

"ANCHOR" AND "STAR" BRANDS.

19 AND 21 CLIFF STREET, NEW YORK.

Factories at Ansonia Conn.

## W. D. WOOD & CO.'S

Limited.

PATENT PLANISHED SHEET IRON.

Patented March 14, 1865; April 8, 1873; Sept. 9 1873; Oct. 6, 1874; Jan. 11, 1876.

Guaranteed fully equal, in all respects, to the

IMPORTED RUSSIA IRON,

And at a much less price.

LOCOMOTIVE JACKET IRON

Our Specialty.

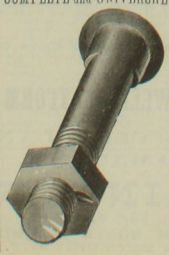
For sale by all the principal Metal Dealers in the large cities throughout the United States, and at their office,

111 Water Street, Pittsburgh, Pa.

## THE DEED NUT LOCK

THE ONLY

COMPLETE and UNIVERSAL NUT LOCK.



Suitable for All Kinds of Bolts.

CAN BE REMOVED WITHOUT INJURY TO EITHER BOLT OR NUT.

DEED NUT LOCK CO., Terre Haute, Ind.

JOHN T. SCOTT, Gen. Man.

WM. MACK, Pres.

## TO STEAM USERS.

I will Remove and Prevent Scale in any Steam Boiler, or make no charge. My Remedy will also Neutralize the most destructive waters, and prevent

GROOVING, PITTING AND WASTING OF IRON,

Which causes so many Boiler Explosions.

A BOOK ON CARE AND MANAGEMENT OF BOILERS FREE.

Address GEO. W. LORD, 316 Union Street, PHILADELPHIA, PA.

## NEWTHS LOCOMOTIVE ASH-PAN COMPANY.

Now in use on over 20 Trunk Lines.

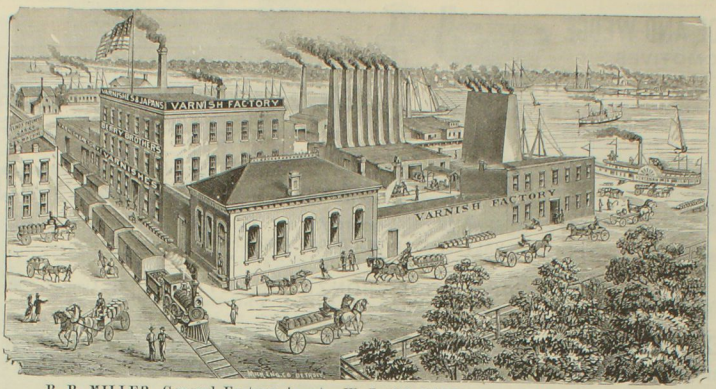
Easily attached to any Locomotive, guaranteed to save over Four and One-half Tons of Coal in every Thousand Miles run.

No burning of Grate Bars. No carting away of Cinders. No risk to Human Life.

ADDRESS—NEWTHS LOCOMOTIVE ASH-PAN COMPANY, DETROIT, MICH

# BERRY BROTHERS, DETROIT, MICH., MANUFACTURERS OF RAILWAY VARNISHES.

ESTABLISHED IN 1858. USE BERRY BROTHERS' RAILWAY VARNISHES




ESTABLISHED IN 1858. USE BERRY BROTHERS' RAILWAY VARNISHES.

B. R. MILLER, General Eastern Agent. W. L. EN EARL, General Western Agent.

# THE E. D. ALBRO COMPANY,

DIRECT IMPORTERS OF

# MAHOGANY

(Via New Orleans),

MANUFACTURED TO SIZES SPECIALLY ADAPTED FOR

# CAR-BUILDERS.

MANUFACTURERS OF

# VENEERS, CAR-BUILDERS' MATERIAL

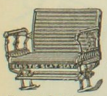
FROM DOMESTIC AND FOREIGN WOODS.

685--711 West 6th St., **CINCINNATI, O.**

Estimates and Price Lists Furnished.

# HALE & KILBURN MANUFACTURING COMP'Y,

48 AND 50 NORTH SIXTH STREET, PHILADELPHIA, PA.,


ELASTIC SLAT SEAT.

REFERENCES.
N. Y. C. & H. R. R. CO.
N. Y. ELEVATED R. R.
ILL. CENTRAL R. R.
PULLMAN P. C. CO.
PENN. R. R. CO.
N. Y. & N. ENG'D R. R.
BALT. & O. R. R.
AND ONE HUNDRED OTHERS.

RATTAN SPRING SEAT.

EXTENSIVE MAKERS OF **PATENTED CAR SEATS** AND SPRINGS.

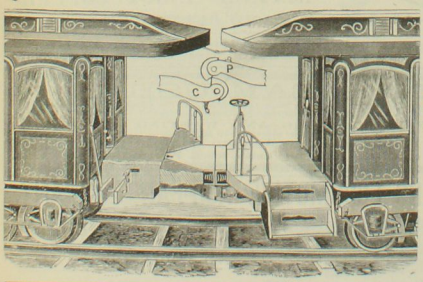
SPRING EDGE SEAT.

ESTIMATES, CIRCULARS AND SAMPLES FURNISHED ON APPLICATION.

PARLOR CAR CHAIR.

# THE COWELL PLATFORM

Is the only device forming **A CONTINUOUS FLOOR** between cars in motion, and **PREVENTING JERKING** in starting and stopping trains.



## THE COWELL COUPLING

Is an Improvement on the Miller and Works with it.

"Entire Satisfaction"—"Perfect Satisfaction" are the words used by R. F. Smith, Gen'l Manager Cleveland & Pittsburgh R. R.; Hiram Fowler, Supt. Connecticut Valley R. R.; J. W. Thomas, Gen'l Supt. Nashville, Chattanooga & St. Louis Ry.; J. G. Sawyer, Master Car-Builder same road, and many others.

"The most practical and perfect device in use"—S. L. Bell, an old Conductor Western & Atlantic R. R.; G. R. Carr, Gen'l Sup't Columbus, Hocking Valley & Toledo R. R.; J. W. Babcock, for years conductor N. Y., Pa. & Ohio Ry.; Geo P. Pease, of Ohio Central Railway.

"Saving much annoyance to passengers"—Chas. B. Couch, Div. Sup't Lake Shore & M. S. Ry., and others.

"A great improvement over any other device I have seen"—J. H. Tinney, Supt N. Y. & Greenwood Lake Railway.

"It prevents jerking in starting and stopping trains," say Messrs. Babcock, Bell, Couch, Thomas, Tinney and others.

"A great saving to railroads," say Messrs. Smith, Thomas, Tinney, Fowler, Bell, Babcock, and others.

**Refer to the Flint & P. M., Utica I. & Elmira, Cin. Southern, C., N. O. & T. Pacific, W. & A., etc., etc.**

## THE COWELL PLATFORM & COUPLING CO.,

CLEVELAND, O.

EWALD IRON COMPANY,

OWNERS AND OPERATORS OF

# —TENNESSEE ROLLING WORKS.—

Tennessee Charcoal Bloom Boiler Plate, Flange, Fire Box, Sheet, Bar and Stay-Bolt Iron.

ST. LOUIS OFFICE, - - - - 801 NORTH SECOND STREET.

MANUFACTURE CHARCOAL IRON EXCLUSIVELY.

# DIRECTORY

of the Railroads of the United States and Canada, showing the gauge, length of road, number of locomotives and number of cars; and giving the names and titles of their principal officers in charge of the operating, purchasing and rolling stock department.

## A

Adirondack R. R. 4-8½ gauge 60 m. 3 to. 62 cars.
C. E. Durkee, *Supt.*.....Saratoga, N. Y.
Jacob Myers, *M. M.*.....Saratoga, N. Y.
Jas. J. Traver, *M. M. & B.*.....Saratoga, N. Y.
Addison & Northern Penn's Ry. 3 g. 40 m. 5 to. 50 c.
F. M. Baker, *Gen. Sup't.*.....Addison, N. Y.
Alabama Great So'n R. R. (*See Cin., N. O. & T. P.*)
Albany & Susquehanna R. R. (*See D. & H. Canal Co.*)
Albemarle & Raleigh R. R. 4-8½ g. 33 m. 3 to. 35 c.
Jas. H. Petty, *Gen. Sup't.*.....Tarboro, N. C.
Albert Ry.
G. A. Robinson, *Man. & Pur. Agt.*Hillsboro, N. B.
Jas. McKay, *M. M. & C. B.*.....Hillsboro, N. B.
Alexandria & Fredericksburg Ry. (*See Potomac, R. R.*)
Alexandria & Washington R. R. (*7) Div.*
Allegheny Valley R. R. 4-0 g. 250 m. 70 lo. 2202 c.
David McCargo, *Gen. Sup't & Pur. Agt.*Land
C. B. Price, *Supt.* (Div. No. 1).....Allison, Pa.
A. A. Jackson, *Supt.* (1, G. Div.).Reynoldsville, Pa.
W. A. Wood, *M. M.*.....Verona, Pa.
R. Gunning, *M. C. B.*.....Verona, Pa.
Alliance, Niles & Ashtabula R. R. (*See Penna. Co.*)
Annapolis & Elk Ridge R. R. 4-8½ g. 20 m. 4 lo. 29 c.
W. B. Bians, *Supt. & Pur. Agt.* Annapolis, Md.
John L. Beall, *M. Mach.*.....Annapolis, Md.
Antwerp & Paulding R. R. 4-8½ g. 27 m. 2 lo. 30 c.
E. C. Munson, *Gen. Man.*.....Antwerp, O.
William Fitzsimmons, Jr., *Pur. Agt.*Antwerp, O.
Arizona & New Mexico Ry. 3 g. 71 m. 3 l. 60 cars.
W. H. Jones, *Gen. Supt. & P. A.*Lordsburg, N. M.
W. C. Boylan, *M. M. & M. of M.*Lordsburg, N. M.
Arkansas Midland R. R. 3-6 g. 63 m. 4 lo. 45 cars.
A. H. Johnson, *P. & Gen. Agt.*.....Helena, Ark.
J. B. Johnson, *M. M. & M. C. B.*.....Helena, Ark.
Asheville & Spartanburg R. R. 5 g. 40 m. 2 lo. 12 c.
Jas. Anderson, *Supt. & Pur. Agt.*Spartanburg, S. C.
*M. M.*.....Spartanburg, S. C.
W. B. Brown, *M. C. B.*.....Spartanburg, S. C.
Ashland Coal & Iron Ry. 4-8½ g. 22 m. 7 lo. 432 c.
Douglas Putnam, Jr., *Gen. Supt.* Ashland, Ky.
Robt. Peebles, *Pur. Agt.*.....Ashland, Ky.
E. M. Roberts, *M. M.*.....Ashland, Ky.
Ashtabula & Pittsburgh Div. (*See Penna. Co.*)
Atchison, Topeka & Santa Fé R. R.
4-8½ g. 2,020 m. 348 lo. 0,629 cars.
A. A. Robinson, *Gen. Sup't.*.....Topeka, Kan.
Geo. B. Harris, *Asst. Gen. Man.*.....Topeka, Kan.
Geo. Hackney, *Supt. Mach. Dept.*.....Topeka, Kan.
Chas. Hackney, *Asst. Sup. Mach. Dept.* do.
Geo. Hargraves, *Pur. Agt.*.....Topeka, Kan.
Eastern Div.: D. J. Chadwick, *Supt.*.....Topeka, Kan.
Henry Hull, *G. F. Car Dept.*.....Topeka, Kan.
John Fagan, *M. M.*.....Topeka, Kan.
J. M. Smith, *M. M.*.....Kansas City, Mo.
Alfred Taylor, *M. M.*.....Emporia, Kan.
Mid. Div.: H. R. Nickerson, *Supt.*.....Nickerson, Kan.
W. Y. Johnson, *M. M.*.....Nickerson, Kan.
do.
W. Div.: C. M. Rathburn, *Supt.*.....La Junta, Col.
A. C. Stiles, *M. M.*.....La Junta, Col.
D. H. Dotterer, *M. M.*.....Pueblo, Col.
So. Div. (Geo. L. Sands, *Supt.*.....Las Vegas, N. M.
F. P. Woodruff, *M. M.*.....Las Vegas, N. M.
J. H. Holman, *M. M.*.....Wallace, N. M.
E. Hackett, *M. M.*.....San Marcial, N. M.
H. P. Olcott, *M. M.*.....Albuquerque, N. M.
Geo. A. Hancock, *M. M.*.....El Paso, Tex.
Sonora Div.:.....265 m.
H. Waugh, *M. M.*.....Guaymas, Mex.
Kan. Cy., Law. & So. Kan.
4-8½ g. 320 m. 24 lo. 787 c.
J. L. Barnes, *Supt.*.....Lawrence, Kan.
J. S. Volk, *M. M.*.....Lawrence, Kan.
Atlanta & West Point R. R. (*See Western of Ala.*)
Atlantic & North Carolina R. R. (*See Midland N. C.*)
Atlantic & Ohio R.R. (*See Norfolk & Western R. R.*)
Atlantic & Pacific R. R. 4-8½ g. 575 m.
F. W. Smith, *G. Sup't.*.....Albuquerque, N. M.
A. G. Thompson, *Pur. Agt.*.....St. Louis, Mo.
Geo. Chalender, *Supt. M. P. & M.*, and
Geo. F. Chalender, *Jr., Asst.*Albuquerque, N. M.
*Div. Supt.*.....Williams, Ariz.
Augusta & Knoxville R. R. (*See Port Royal & Aug.*)
Austin & Northwestern R. R. 3 g. 60 m. 5 lo. 75 c.
J. A. Rhomberg, *Gen. Man.*.....Austin, Tex.

## B

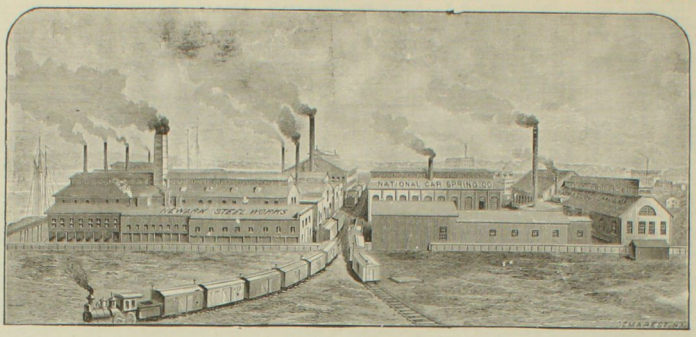
Bachman Valley R. R. (*See Han. Junc., Han. & Gett.*)
Balt. & Delaware Bay R. R. 4-8½ g. 50 m. 2 lo. 18 c.
Chas. Gerker, *Gen. M. & P. P.*.....Baltimore, Md.
Baltimore & Hanover R. R. (*See H. J., H. & G.*)
Baltimore & Ohio R. R.
4-8½ g. 1,612 m. 574 lo. 17,339 cars.
S. Spencer, *3d V. P. & Gen. Man.*Baltimore, Md.
W. S. Hill, *Pur. Agt.*.....Baltimore, Md.
Ohio Riv. Div. 4-8½ g. 972 m.
W. M. Clements, *Asst. Trans. Agt.*.....Baltimore, Md.
A. J. Cromwell, *Act. M. of M.*.....Baltimore, Md.
Jno. W. Clark, *M. C. B.*.....Baltimore, Md.
I. N. Kalbaugh, *M. M.*.....Baltimore, Md.
Wm. Edwards, *M. M.*.....Martinsburg, W. Va.
Sam. Houston, *M. Mach.*.....Martinsburg, W. Va.
Robert Maxwell, *M. M.*.....Cumberland, Md.
S. B. Crawford, *M. M.*.....Grafton, W. Va.
Alex. Laird, *M. M.*.....Parkersburg, W. Va.
W. B. McClung, *M. M.*.....Wheeling, W. Va.
Pitts. Div.: T. B. Kingsbury, *Supt.*.....Pittsburgh, Pa.
J. E. Sampsell, *Ast. M. of M.*Connellsville, Pa.
Trans-Ohio Divs.: G. J. Forsaere, *G. Man.*Newark, O.
W. H. Harrison, *Asst. M. of M.*.....Newark, O.
E. L. Weisgerber, *M. M.*.....Newark, O.
H. M. Ingler, *M. M.*.....Bellaire, O.
O. B. Perkins, *M. M.*.....Zanesville, O.
Andrew Beckert, *M. M.*.....Sandusky, O.
F. J. Gunther, *M. M.*.....Chicago Junction, O.
Chi. Div.:.....Gen. *Supt.*.....Chicago, Ill.
Benj. Lowther, *M. M.*.....Chicago, Ill.
W. H. Wilkinson, *M. M.*.....Kingston, Ill.
Baltimore & Philadelphia. 4-8½ g. 20 m. 4 lo. 0 c.
Wm. Hoopes, *Supt.*.....Wilmington, Del.
Baltimore & Potomac R. R. (*See Penna. R. R.*) (7) *Div.*
Bangor & Piscataquis R. R. 3 g. 57 m. 2 lo. 87 cars.
Arthur Brown, *Supt. & Pur. Agt.*.....Bangor, Me.
C. S. Nason, *M. M.*.....Bangor, Me.
J. W. Combs, *M. C. B.*.....Oldtown, Me.
Bangor & Portland Ry. 4-8½ g. 55 m. 3 lo. 3 c.
S. Morse, *Pres.*.....Bangor, Me.
Barclay R. R. 4-8½ g. 16 m. 6 l. 200 c.
F. F. Lyon, *Supt.*.....Barclay, Pa.
J. A. Hardenbergh, *Pur. Agt.*.....21 Cortlt. st., N. Y.
Wm. Johnson, *M. M.*.....Towanda, Pa.
Batesville & Brinkley R. R. 3 g. 25 m. 1 lo. 12 c.
Wm. Black, *Pres. & Gen. Supt.*.....Brinkley, Ark.
W. J. Thompson, *Gen. Man.*.....Little Rock, Ark.
R. B. Davis, *Pur. Agt.*.....Brinkley, Ark.
Patrick John White, *M. M.*.....Brinkley, Ark.
Baton Rouge, Grosse Tête & Opelousas R. R.
5-6 g. 23 m. 3 lo. 12 c.
D. C. Montan, *Gen. Supt.*.....Port Allen, La.
Bedford & Bloomfield Ry. 3 g. 43 m. 5 lo. 65 cars.
Jas. W. Kennedy, *Gen. Supt. & Pur. Agt.*; and
Capt. Geo. Elliott, *M. M.*.....Bedford, Pa.
Richard G. Elliott, *M. C. B.*.....Bedford, Ind.
Bellaire, Zanesville & Cin. Ry. Co. 3 g. 42 m. 5 lo. 71 c.
S. L. Mooney, *Gen. Sup't.*.....Woodsville, O.
J. B. Hong, *M. M.*.....Bellaire, O.
Bell's Gap R. R. 4-0 g. 23 m. 4 lo. 0 c.
R. G. Ford, *Supt.*.....Bellwood (P. O.), Pa.
Gen. Van Rumi, *M. M.*.....Bellwood, Pa.
A. Zimmerman, *M. C. B.*.....Bellwood, Pa.
Belt R. R. 4-8½ g. 12 m. 10 lo.
W. P. Ijams, *Supt.*.....Huntington, Ind.
Bennington & Rutland Ry. 4-8½ g. 50 m. 15 lo. 256 c.
F. C. White, *Supt. & Pur. Agt.*.Bennington, Vt.
G. W. Blanchard, *M. M.*.....Rutland, Vt.
Berlin Branch R. R. (*See Han. Junc., Han. & Gett.*)
Bingham, Canyon & Camp Floyd (*See Den. & Rio Gr.*)
Bladen, Columbus & Florida. 4-8½ g. 16 m. 2 lo. 2 c.
John Colville, *Pres.*.....Wilmington, N. C.
Bodie & Benton Ry. 3 g. 34 miles
Thomas Holt, *Supt. & Pur. Agt.*.....Bodie, Cal.
E. H. Barton, *M. M. & C. B.*.....Bodie, Cal.
Boston, Barre & Gardner. 4-8½ g. 37 m. 8 lo. 108 c.
H. H. Marshall, *Supt. & P. A.*.Worcester, Mass.
Frank L. Goodwin, *M. M.*.....Worcester, Mass.
Boston, Concord, Montreal & White Mts. R. R.
4-8½ g. 107 m. 40 lo. 1,116 cars.
W. A. Stearns, *Supt.*.....Plymouth, N. H.
Geo. W. Storer, *Pur. Agt.*.....Boston, Mass.
R. Adams, *M. M.*.....Lake Village, N. H.
G. A. Ferguson, *Asst. M. M.*.Lake Village, N. H.
L. D. Pickering, *M. C. B.*.....Lake Village, N. H.
Whitefield & Jefferson Div.:
A. L. Brown, *Supt.*.....Whitefield, N. H.
Boston, Hoosac Tunnel & W'n Ry.
4-8½ g. 87 m. 18 lo. 1,038 cars.
H. L. Morrill, *Gen. Man.*.....Mechanicsville, N. Y.
C. H. Crafts, *Pur. Agt.*.....Mechanicsville, N. Y.
C. H. Cory, *Supt. & M. M.*.....Mechanicsville, N. Y.
John S. Ellis, *M. C. B.*.....Mechanicsville, N. Y.
Boston, Revere Beach & Lynn R. R. 3 g. 9 m. 7 lo. 46 c.
C. A. Hammond, *Supt. & P. Agt.*Bogton, Mass.
R. D. Sutherland, *M. M.*.....Boston, Mass.
John Coghlan, *M. C. B.*.....Boston, Mass.
Boston, Winthrop & Point Shirley R. R.
3 g. 10 m. 1 lo. 8 c.
C. A. Parks, *Supt.*.....Boston, Mass.
J. W. Wilson, *M. M.*.....Winthrop, Mass.
Boston & Albany R. R. 4-8½ g. 372 m. 245 lo. 6,111 c.
W. H. Barnes, *Gen. Supt.*.....Springfield, Mass.
E. Gallup, *Asst. Supt.*.....Springfield, Mass.
A. B. Underhill, *Supt. M. P.*.....Sorturffield, Mass.
T. D. Adams, *Gen. M. C. B.*.....Allston, Mass.
H. B. Chesley, *Div. Supt.*.....Boston, Mass.
G. H. Colby, *Div. M. M.*.....Springfield, Mass.
C. E. Grover, *Div. Supt.*.....Springfield, Mass.
H. W. Eldy, *Div. M. M.*.....Springfield, Mass.
J. B. Worthington, *Div. Supt.*.....Springfield, Mass.
W. H. Russell, Jr., *Div. Supt.*E. Albany, N. Y.
H. Purvis, *Div. M. M.*.....East Boston, N. Y.
J. E. Doran, *For. Car Sh.*.East Albany, N. Y.
Boston & Lowell R. R.
4-8½ g. 140 m. 82 lo. 2,565 cars.
C. S. Mellen, *Supt.*.....Boston, Mass.
F. H. Bowers, *Asst.*.....Boston, Mass.
J. F. Crockett, *Supt. T. & Mach.*.Boston, Mass.
Boston & Maine R. R. 4-8½ g. 236 m. 80 lo. 2,200 c.
J. T. Furber, *Gen. Supt. & P. A.*.Boston, Mass.
Geo. J. Fisher, *Pur. Agt.*.....Boston, Mass.
Wm. Smith, *M. M.*.....East Boston, N. H.
D. C. Richardson, *M. C. B.*.....Lawrence, Mass.
Boston & N. Y. Air Line R. R. (*See N. Y. H. & H.*)
Boston & Providence R.R. 4-8½ g. 67 m. 52 lo. 1,006 c.
A. A. Folsom, *Gen. Supt. & P. A.*.Boston, Mass
Geo. Gunnison, *Gen. Pass. Agt.*.Boston, Mass.
Jno. Lightner, *M. C. B.*.....Roxbury, Mass.
Bowling Green R. R. 4-8½ g. 3 m. 1 lo. 2 c.
W. A. Wiggins, *Gen. Man.*Bowling Green, O.
Wm. A. Wiggins, *Pur. Agt.*.Bowling Green, O.
Bradford, Bordell & Kinzua R. R. 3 g. 24 m. 2 lo. 20 c.
Bradford, Eldred & Cuba. 3 g. 54 m. 6 l. 158 c.
Tonawanda Valley & Cuba. 3 g. 36 m. 3 l. 100 c.
B. C. Williams, *Gen. Man. & P. A.*.Brad fd, Pa.
Jno. Delaney, *M. M. & C. B.*.....Bradford, Pa.
Braddeboro Terminal R. R. 3 g. 2 36 m. 1 lo. 2 c.
*(Operated by Central Vermont.)*
Breakwater & Frankford R. R. (*See Del., Md. & Va.*)
Bridgton & Saco River R. R. 3 g. 16 m. 2 lo. 19 c.
Wm. F. Ferry, *Gen. Supt.*.....Bridgton, Me.
M. M. Caswell, *M. M. & Pur. Agt.*Bridgton, Me.
Brighthope Ry. 3 g. 37 m. 4 lo. 193 cars.
Jas. R. Worth, *Supt.*.....Richmond, Va.
P. M. Buckingham, *Pur. Agt.*.Richmond, Va.
A. Gary, *Supt. Way & Works.*Winterpock, Va.
Robt. Krebill, *M. M.*.....Chester, Va.
Brooklyn, Bath & Coney Island R. R.
4-8½ g. 7 m. 8 lo. 36 cars.
Geo. A. Gunther, *Gen. Man.*.Brooklyn, N. Y.
Aug. Wolff, *M. M.*.....Brooklyn, N. Y.
Brooklyn, Flatbush & Coney Island Ry.
4-8½ g. 7 m. 7 lo. 54 c.
J. L. Morrow, *Supt. & P. A.*.Brooklyn, N. Y.
Wm. Finley, *M. M.*.....Brooklyn, N. Y.
Brooklyn & Rockaway Beach R. R.
4-8½ g. 7 m. 4 lo. 8 cars.
Wm. Warner, *Supt.*.....East New York, N. Y.
Brunswick & Western R. R. 5 g. 172 m. 14 lo. 370 c.
H. S. Haines, *Gen. Man. & P. A.*.Brunswick, Ga.
R. J. Evans, *Supt.*.....Brunswick, Ga.
W. T. Kline, *M. M.*.....Brunswick, Ga.
Buff., N. Y. & Phil. R. R. 3 & 4-8½ g. 655 m. 120 l. 6,330 c.
Oliver Watson, *Gen. Man.*.....Buffalo, N. Y.
Geo. S. Gatchell, *Gen. Supt.*.....Buffalo, N. Y.
W. W. Halsey, *Asst. to G. Supt.*.Buffalo, N. Y.
J. H. Boole R. R. *Gen. Pass. Agt.*.Buffalo, N. Y.
Allen Vail, *Supt. M. P. & M.*.....Buffalo, N. Y.
Buff. Div.: Henry Dwyer, *Supt.*.....Buffalo, N. Y.
Roch. Div.: J. W. Watson, *Supt.*.....Rochester, N. Y.
Pitts. Div.: E. H. Witter, *Supt.*.....Oil City, Pa.
H. J. Bookhammer, *M. M.*.....Oil City, Pa.
John Monks, *M. C. B.*.....Oil City, Pa.
E. E. Turner, *M. M.*.....Olean, N. Y.
Burlington, Cedar Rapids & Northern Ry.
4-8½ g. 713 m. 76 lo. 3,006 cars.
C. J. Ives, *Gen. Supt.*.....Cedar Rapids, Ia.
Robt. Williams, *Supt.*.....Cedar Rapids, Ia.
T. Stickney, *Pur. Agt.*.....Cedar Rapids, Ia.
R. W. Bushnell, *M. M. & C. B.*.Cedar Rapids, Ia.
Burlington & Lamoille R. R. 4-8½ g. 35 m. 4 lo. 64 c.
G. L. Linsley, *Gen. Man. & P. A.*.Burlington, Vt.
F. G. Brownell, *M. M., M. C. B. & P. A.* do.
Burlington & Mo. Riv. R. R. (in Neb.) (*See C. B. & Q.*)
Burlington & North-West'n Ry. 3 g. 20 m. 2 lo. 27 c.
Burlington & Western R. R. 3 g. 15 m. 38 c.
W. Wilson, *Supt.*.....Burlington, Ia.
Burlington & Ohio River R. R. 4-8½ g.
R. Tanner, *Pur. Agt.*.....Chicago, Ill.

## C

California Northern R. R. 4-8½ g. 26 m. 2 lo. 17 c.
Andrew J. Bitney, *Gen. Man.*.Marysville, Cal.
California Southern R. R. 4-8½ g. 127 m. 13 lo. 301 c.
J. N. Victor, *Supt.*.....National City, Cal.
J. M. Keith, *M. M.*.....National City, Cal.
Cambridge & Seaford. (*See Penna. R. R.*) (4) *Div.*)
Camden Atlantic R. R. (*See Penna. R. R.*) (2) *Div.*)
Canada Southern Ry. (*See Mich. Cen.*) (2) *Div.*)
Canada Atlantic Ry.
D. C. Linsley, *Man.*.....Ottawa, Ont.
M. Donaldson, *M. M.*.....Ottawa, Ont.
Canadian Pacific R. R. 4-8½ g. 1,742 m. 0 lo. 87 cars.
W. C. Van Horne, *Gen. Man.*.....Montreal, Que.
T. G. Shaughnessy, *Asst. G. Man.*Winnipeg, Man.
T. R. F. Brown, *Mech. Supt.*.....Montreal, Que.
G. B. Shaughnessy, *Pur. Agt.*.....Montreal, Que.
E. Div.: Archer Baker, *Gen. Supt.*.Montreal, Que.
Tho. Irwin, *Mech. Supt.*.....Brockville, Ont.
W. Div.: J. H. Mead, *Gen. Supt.*.....Winnipeg, Man.
F. C. Butterfield, *M. M. & M. C. B.*Winnipeg, Man.
Cape Fr. & Yadkin Val. R. R. 4-8½ g. 112 m. 7 lo. 60 c.
E. Morrison, *Gen. Supt.*.....Fayetteville, N. C.
Isaac W. Clark, *M. M. & C. B.*.Fayetteville, N. C.
Cape Girardeau Southwestern R. R.
4-8½ g. 33 m. 3 lo. 20 cars.
Louis Houck, *Gen. Man.*.....Cape Girardeau, Mo.
W. A. Penney, *Gen. Sup't & Pur. Agt.*Cape Girardeau, Mo.
W. H. Wheeler, *Pur. Agt.*.....Cape Girardeau, Mo.
Fred Glover, *M. M.*.....Cape Girardeau, Mo.
Carolina Central R. R. (*See Rol. & Aug.*)
Carson & Colorado R. R. (*See Va. & Truckee.*)
Catasauqua & Fogelsville. 4-8½ g. 25 m. 2 lo. 381 c.
C. W. Chapman, *Supt. & P. A.*.Catasauqua, Pa.
J. Thomas, *M. M.*.....Hokendauqua, Pa.
Chas. J. Hollach, *M. C. B.*.....Catasauqua, Pa.
Catskill Mountain R. R. 3 g. 16 m. 2 lo. 20 cars.
Charles A. Beach, *Supt.*.....Catskill, N. Y.
Cazenovia, Canastota & De Ruyter. (*See U., I. & E.*)
Central and Southern Railroads (7in.).
5 g. 1,115 m. 145 lo. 2,008 cars.
W. G. Raoul, *Pres.*.....Savannah, Ga.
Wm. Rogers, *Gen. Supt.*.....Savannah, Ga.
C. H. Carson, *Pur. Agt.*.....Savannah, Ga.
Cen. Div.: D. D. Arden, *M. M.*.....Savannah, Ga.
T. F. Warwick, *M. M.*.....Augusta, Ga.
F. Devine, *M. C. B.*.....Savannah, Ga.
So. West'n Div.: T. D. Kline, *Supt.*.....Macon, Ga.
D. M. Gugel, *M. M.*.....Macon, Ga.
James A. Knight, *M. C. B.*.....Macon, Ga.
Central R. R. of N. J. (*See Phil. & Read.*) *N. J. Cen. Div.*)
Central R. R. of S. C. (*See Wil. & W'd.*)
Central American & Pacific Ry. 3 g. 67 m. 1 lo. 11 c.
W. C. Fitzsimmons, *Gen. Supt.*.Escuintla, Guat.
Central Branch Union Pac. (*See Mo. Pac.*) (3) *Div.*)
Central Iowa Ry. 4-8½ g. 412 m. 50 lo. 1,050 cars.
E. L. Dudley, *Supt.*.....Marshalltown, Ia.
J. G. Johnston, *Asst. Supt.*.....Marshalltown, Ia.
P. D. Phelps, *Asst. Supt.*.....Monmouth, Ill.
W. R. Coppock, *Asst. Pur. Agt.*Marshalltown, Ia.
John Player, *M. M.*.....Marshalltown, Ia.
T. L. Sewers, *M. C. B.*.....Marshalltown, Ia.
Central Ontario Ry. 4-8½ g. 33 m. 4 lo. 66 cars.
G. W. McMillan, *Pres.*.....Picton, Ont.
James Falconar, *M. M.*.....Trenton, Ont.
Central Pac. R. R. 4-8½ g. 1,300 m. 382 lo. 11,590 c.
A. N. Towne, *Gen. Man.*.....San Francisco, Cal.
J. A. Fillmore, *Gen. Supt.*.....San Francisco, Cal.
R. H. Pratt, *G. Pur. Agt.*.....San Francisco, Cal.
J. R. Watson, *Gen. Pur. Agt.*.Sacramento, Cal.
A. J. Stevens, *Gen. M. C. B.*.....Sacramento, Cal.
W. McKenzie, *Asst. G. M. M.*.Sacramento, Cal.
Benj. Welch, *Gen. M. C. B.*.....Sacramento, Cal.
G. J. Brennan, *Asst. G. M. C. B.*Sacramento, Cal.
Western: Visalia & Tulare Divs. and Northern Ry.
A. D. Wilder, *Supt.*.....Oakland, Cal.
G. D. Welch, *M. M.* (W. Div.).W. Oakland, Cal.
W. B. Ludlow, *M. C. B.* (W. Div.)
S. Johnson, *M. M.* (T. Div.).....Tulare, Cal.
D. Rutherford, *M. M.* (N. Rd.).S. Vallejo, Cal.
Sacramento Div. and Cal. Pac. R. R.
J. B. Wright, *Supt.*.....Sacramento, Cal.
M. W. Cooley, *M. M.* (S. Div.).Sacramento, Cal.
Truckee Div.: J. B. Whited, *Supt.* Wadsworth, Nev.
Geo. Gregg, *M. M.*.....Wadsworth, Nev.
J. C. Ryan, *G. Car Sh.*.....Wadsworth, Nev.
Humb't Div.: G. W. Coddington, *Supt.*Carlin, Nev.
W. F. Smith, *M. M.*.....Carlin, Nev.
J. C. Wright, *For. Car Sh.*.....Carlin, Nev.
Salt Lake Div.: A. G. Fell, *Supt.*.....Ogden, Utah.
Jas. Hamilton, *M. M.*.....Ogden, Utah.
A. Sherburne, *For. Car Sh.*.....Ogden, Utah.
Colorado Div.: C. Dormour, *Supt.*.Sacramento, Cal.
S. C. & R. R.: R. L. Myrick, *Supt.*.Stockton, Cal.
Los Angeles; and Yuma Divs. (So. Pac.):
E. E. Hendee, *Gen. Supt.*.....Los Angeles, Cal.
James Velsir, *M. M.*.....Los Angeles, Cal.
T. T. Whitelaw, *For. Car Sh.* Los Angeles, Cal.
Arizona Divs. (So. Pac.):
J. A. Muir, *Asst. Supt.*.....Tucson, Ariz.
W. F. Hamilton, *M. M.*.....Tucson, Ariz.
Rio Grande (S. Pac.) & El Paso (G. H. & S. A.) Divs.:
J. Campbell, *Supt.*.....El Paso, Texas.
J. L. Bonnell, *M. M.*.....El Paso, Texas.
H. C. Standish, *For. Sh.*.....El Paso, Texas.
Galveston, Harrisburg & San Antonio Ry.
E. G. Thompson, *Supt.*.....Houston, Tex.
San Anto. Div.: E. H. Van Vleck, *Man.*San Antonio, Tex.
J. J. Ryan, *M. M.*.....San Antonio, Tex.
Houston Div.: H. Flanders, *Supt.*.Harrisburg, Tex.
D. F. Sullivan, *M. M.*.....Houston, Tex.
Louisiana Div.: W. Irwin, *Supt.*.....Houston, Tex.
D. C. Hall, *M. M.*.....Houston, Tex.
J. M. Mather, *M. C. B.*.....Houston, Tex.
El Paso Div.: Jas. Campbell, *Supt.*.El Paso, Tex.
W. C. Arp, *M. M.*.....El Paso, Texas.
Central Texas & N'w'n R. R. (*See Hous. & Tex. Cen.*)
Central Vermont R. R. 4-8½ g. 673 m. 30 lo. 2,000 c.
W. Hobart, *Gen. Man.*.....St. Albans, Vt.
J. M. Foss, *Asst. Gen. Supt. & M. M.*St. Albans, Vt.
No. Div.: J. E. Dana, *Gen. Pass. Agt.*.....St. Albans, Vt.
Rut. Div.: J. Burdett, *Supt.*.....Rutland, Vt.
N. L. Davis, *M. M.*.....Rutland, Vt.
Brattleboro & Whitehall R. R., and
Brat. Div.: E. F. Brooks, *Supt.*.Brattleboro, Vt.
New London Div.: C. H. Smith, *Supt.*.New London, Ct.
C. F. Spaulding, *Supt. & P. A.* New London, Ct.
J. W. Dow, *M. M.*.....New London, Ct.
S. O. Banks, *M. C. B.*.....New London, Ct.
Chagrin Falls & Southern R. R. 3 g. 6 m. 1 lo. 12 c.
H. Bissell, *Gen. Man.*.....Chagrin Falls, O.
J. W. Williams, *Gen. Supt.*.....Chagrin Falls, O.
Charleston & Savannah Ry. 5 g. 115 m. 7 lo. 190 c.
H. S. Haines, *Gen. Man.*.....Savannah, Ga.
C. S. Gadsden, *Gen. Supt.*.....Charleston, S. C.
Chas. Hall, *M. M.*.....Charleston, S. C.
Charlotte, Columbia & Augusta R. R. (*See Rich. & D.*)
Chateaugay R. R. 3 g. 34 m. 7 lo. 100 cars.
A. L. Ingalls, *Gen. Man.*.....Plattsburg, N. Y.
J. M. Davies, *Supt.*.....Lyon Mountain, N. Y.
H. S. French, *Asst.*.....Plattsburg, N. Y.
Chattarol Ry. 4-8½ g. 51 miles 11 loco. 483 cars.
C. H. Rockwell, *Gen. Man. & P. A.*Ashland, Ky.
J. R. Morris, *Supt.*.....Ashland, Ky.
Joseph P. Burleigh, *M. C. B.*.....Ashland, Ky.
Cheraw & Chesterfield R. R. (*See Rich. & Pet.*)
Cheraw & Darlington R. R. (*See Wil. & W'd.*)
Cheraw & Salisbury R. R. (*See Wil. & W'd.*)
Cherry Creek R. R. 4-8½ g. 6 m. 3 lo. 6 cars.
Wm. Hendrie, *Supt.*.....Midland, Mo.
Chesapeake, Ohio & South-Western.
4-0 g. 398 m. 62 lo. 1,345 c.
Louisville, Ky.
H. E. Huntington, *Pur. Agt.*.....Louisville, Ky.
J. E. Roszel, *Gen. Sup't.*.....Richmond, Va.
R. H. Briggs, *Supt. M. P.*.....Elizabethtown, Ky.
D. L. Weaver, *M. M.*.....Elizabethtown, Ky.
Jno. Fitzgerald, *M. C. B.*.....Paducah, Ky.
Chesapeake & Ohio Ry. 4-8½ g. 642 m. 169 l. 5,120 c.
C. W. Smith, *Gen. Man.*.....Richmond, Va.
D. A. Sweet, *Asst. to Gen. Man.*Richmond, Va.
A. S. Emmons, *Pur. Agt.*.....Richmond, Va.
T. L. Chapman, *Gen. Sup't.*.....Richmond, Va.
Eastern Div.: A. H. Wood, *Supt.*.....Richmond, Va.
J. N. Lee, *M. M.*.....Richmond, Va.
J. B. Pierce, *M. M.*.....Richmond, Va.
Hunt. Div.: W. B. Ryder, *Supt.*.....Hinton, W. Va.
W. H. Thomas, *M. M.*.Huntington, W. Va.
H. C. Bassinger, *M. C. B.*.Huntington, W. Va.
Lex. Div.: J. Hunter, *Supt.*.....Lexington, Ky.
S. R. Tuggle, *M. M.*.....Lexington, Ky.
K. C. Div.: G. W. Bender, *Supt.*.....Lexington, Ky.
A. H. Smith, *M. M.*.....Lexington, Ky.
F. A. Perry, *M. M.*.....Keene, N. H.
A. E. Forrest, *M. C. B.*.....Keene, N. H.
Chester & Lenoir Ry. (*See Rich. & Dan.*) (3) *Div.*)
Chicago, Burlington & City Ry. (*See C. B. & Q.*)
Chicago, Burlington & Quincy R. R.
4-8½ g. 3,008 m. 945 lo. 21,012 cars.
T. J. Potter, *Gen. Man.*.....Chicago, Ill.
(1) C., B. & Q., East of Mo. Riv.
H. H. Stone, *Gen. Supt.*.....Chicago, Ill.
Wm. Irving, *Gen. Pur. Agt.*.....Chicago, Ill.
G. W. Rhodes, *Supt. M. P.*.....Aurora, Ill.
W. Forsyth, *Mech. Supt.*.....Aurora, Ill.
Ill. Divs.: J. D. Besler, *Supt.*.....Galesburg, Ill.
Chi. Div.: Alex. Mitchander, *Supt.*.....Aurora, Ill.
L. E. Johnson, *M. M.*.....Aurora, Ill.
Galesburg Div.: F. C. Rice, *Supt.* Galesburg, Ill.
Robert Pierce, *M. M.*.....Galesburg, Ill.
St. L. Div.: S. E. Crance, *Supt.*.Beardstown, Ill.
Iowa Div.: C. E. Perkins, *Supt.*.....Burlington, Ia.
Ia. & Mo. Divs.: W. F. Merrill, *Supt.* Burlington, Ia.
East. Div.: O. E. Stewart, *Supt.*.Burlington, Ia.
Joel Glover, *M. M.*.....Burlington, Ia.
Mid. Div.: J. B. Maxon, *Supt.*.....Ottumwa, Ia.
West'n Div.: Jos. Stuart, *Supt.*.....Creston, Ia.
W. W. Eckerson, *M. M.*.....Creston, Ia.
Chi., B. & Kan. C.'s and St. L., Keo. & No.-W'n Rys.
Robt. Troup, *Supt.*.....Keokuk, Ia.
W. H. Bartlett, *M. M.*.....Burlington, Ia.
(2) C., B. & Q., West of Mo. Riv.
G. W. Holdrege, *Asst. Gen. Man.* Omaha, Neb.
C. M. Wead, *Supply Agt.*.....Omaha, Neb.
D. Hawkins, *Pur. Agt.*.....Plattsmouth, Neb.
Bur. & Mo. Riv. & Neb. Ry. Divs.:
T. E. Calvert, *Supt.*.....Lincoln, Neb.
D. E. Thompson, *Supt.*.....Lincoln, Neb.
E. Bignell, *M. M.*.....Lincoln, Neb.
R. V. Div.: A. Campbell, *Supt.*.....McCook, Neb.
A. & N. Div.: J. McConniff, *Supt.*.Lincoln, Neb.
Chicago, Fairchild & East Claire R. R.
4-8½ g. 20 m. 3 lo. 28 cars.
N. C. Foster, *Gen. Man.*.....Fairchild, Wis.
C. I. Wickersham, *Pur. Agt.*.....Chicago, Ill.
Chicago, Milwaukee & St. Paul R. R.
4-8½ g. 4,028 m. 626 lo. 19,018 cars.
S. S. Merrill, *Gen. Man.*.....Milwaukee, Wis.
R. Miller, *Asst. Gen. Man.*.....Milwaukee, Wis.
J. T. Clark, *Gen. Supt.*.....Milwaukee, Wis.
J. T. Crocker, *Pur. Agt.*.....Milwaukee, Wis.
J. M. Lowry, *Gen. M. M.*.....Milwaukee, Wis.
E. Fairbairn, *M. M.*.....Milwaukee, Wis.
John Bailie, *Supt. Car Dept.*.Milwaukee, Wis.
(4) H. C. Atkins, *Asst. Gen. Supt.*.Milwaukee, Wis.
Chi. Div.: Geo. O. Clinton, *Supt.*.....Chicago, Ill.
La Crosse Div.: W. J. G. Collins, *Supt.* Milwaukee, Wis.
O. Bluffs Div.: J. M. Darling, *Supt.*.....Marion, Ia.
P. du C. & M. Pt. Divs.:
R. B. Campbell, *Supt.*.....Milwaukee, Wis.
(2) C. H. Pryor, *Asst. Gen. Supt.*.Minneapolis, Minn.
H. & D. Div.: M. W. Kellie, *Supt.*.....do.
J. O. Pattie, *M. M.*.....Minneapolis, Minn.
Ia. & Minn. Div.: H. R. Williams, *Supt.*.....do.
S. Minn. Div.: F. D. Underwood, *Supt.* Lacrosse, Wis.
Riv. & Dak. Divs.: C. W. Case, *Supt.* Sioux City, Ia.
S. Charnley, *M. M.*.....Dubuque, Ia.
Ia. & Da. Div.: G. W. Sanborn, *Supt.* Mason City, Ia.
S. Cy. & Da. Div.: W. J. Underwood, *Supt.* Sioux Cy., Ia.
F. H. Moulton, *M. M.*.....Yankton, Dak.
J. M. Gilbert, *Supt.*.....Yankton, Dak.
(3) D. A. Olin, *Asst. Gen. Supt.*.....Racine, Wis.
R. & O. Divs.: Paul Dyer, *Supt.*.....Racine, Wis.
John Taylor, *M. M.*.....Racine, Wis.
(4) Northern Div.: H. L. Rock, *Supt.* Milwaukee, Wis.
Riv. & Dak. Extension: C. W. Case, *Supt.* Sioux City, Ia.
Chicago,

BENJAMIN ATHA, Treasurer. RICHARD VOSE, President. D. P. CLARK, Supt.

We make our own Steel for Car Springs.




Spring Manufactory and Steel Works, Newark, N. J.

*The Largest Crucible Cast-Steel Works in the Eastern States.*

**NATIONAL CAR SPRING COMPANY,**

MANUFACTURERS OF

Elliptic, Volute-Spiral Hebbard, Oval, Round Bar, Rectangular-Passenger & Freight Car Springs

OFFICE, 13 BARCLAY STREET, NEW YORK.

# HOPKINS VERSUS LE ROY!

*THE QUESTION.*

*Does the Le Roy Journal Bearing Company "stand ready" to make what are commonly known as Hopkins Journal Bearings, because of numerous disgusting failures, resulting from the use of the weak, gridiron arrangement known as the Le Roy Bearing heretofore made and sold by them, and the consequent necessity of going out of business or giving their customers a really good bearing even if they have to "pirate" the invention for which a patent was granted to Hopkins that has been declared valid by both the Eastern and Western Railroad Association?*

*Does the Le Roy Company expect to build up a business by infringing Hopkins' Patent, and selling bearings, and a lawsuit with them?*

In the recent interference patent fight between Hopkins and Le Roy, the Commissioner of Patents, in his final decision, which was rendered August 31, 1883, says:

"On the broad claim, as well as the specific claim covering the device embodying not only the broad but the specific invention of a journal bearing with a soft metal lining, with ridges or projections so arranged that, upon being brought in contact with the axle, the ridges or projections will yield and spread out so as to make a perfectly-fitting box, priority of invention must be awarded to Hopkins."

As to the specific arrangement for which priority of invention was awarded to Le Roy, all will perceive that the broad claim for which priority of invention is awarded to Hopkins, and the very broad claim embodied in the patent granted him Oct. 16, 1883, in the following words: "A Journal Bearing made of two different metals, one of soft or yielding nature, and the other of a hard or unyielding nature, the soft or yielding carrying ridges or spurs which receive the initial pressure of the journal, and by the rolling action of the same and the load pressure upon the bearing becomes crushed down and spread in conformity with the contour thereof, as described, whereby the surfaces in wearing contact are adjusted to each other, substantially as specified,"

**COVERS THE WHOLE CASE**

*AN OLD ADAGE SAYS:*
*"SUE A BEGGAR AND CATCH A LOUSE."*

*Will Mr. McLean, of the so-called Le Roy Journal Bearing Co., give to Mr. Hopkins and to Railroad Companies and Car-Builders any reliable proof that his Company is in reality anything else than an irresponsible piratical concern (see his advertisement) that is absolutely judgment proof, and any guarantees it may offer against suits by Hopkins are not perfectly worthless, and in so doing will he talk plain, honest common sense, instead of craftily stringing together a lot of words (see his advertisement) that mean nothing unless they mislead?*

*No invention ever did or can infringe any patent. It is not the invention in any case that infringes, but the making, selling or using of a thing patented without the right to do so. Talk about making an offer to settle a point that does not exist is as cheap as it is misleading and worthless.*

As to his being the prior inventor of Bearings with soft metal ridges for receiving the Initial pressure of the Journal, and leaves him absolute master of the situation.

All parties are hereby warned that my rights under said Letters Patent will be enforced.

**D. A. HOPKINS, Patentee and Manufacturer,**

**113 Liberty Street, - - - - New York.**

## VAN DUSEN PATENT NUT LOCK.

A Perfect Nut Lock, Cheaper and Better than Jamb Nuts, or even Wooden Washers.

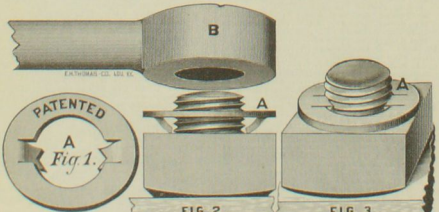



Fig. 1.—*A* represents nut lock detached. Fig. 2.—*A*, nut lock in position, ready to apply; *B*, the tool used in setting the lock—it is simply a bar of iron having a hole ¼ inch larger than the bolt—when placed as indicated one or two smart blows with a hammer on the tool force the lock flat. Fig. 3.—*A* represents the lock applied.

**Price List and Circulars Sent on Application. Address**

PEERLESS MANUFACTURING CO.,

637 Third Avenue - - - - - Louisville, Ky.

## WHITE LEAD.

JEWETT & SONS PERFECTION PURE WHITE LEAD

We have made but ONE QUALITY of WHITE LEAD for the last twenty-five years. It is ground in Refined Linseed Oil, and warranted perfectly pure.

THE JEWETT WHITE LEAD CO.,

28 BURLING SLIP, NEW YORK.

## LINSEED OIL.

J. A. DEAN & CO. PURIFIED LINSEED OIL

All Linseed Oil bearing the above brand delivered by us is of OUR OWN MANUFACTURE, and guaranteed absolutely pure.

Our BOILED OIL will be POSITIVELY BOILED.

J. A. DEAN & CO.,

181 FRONT STREET, NEW YORK.

Ala. Gr. S'n Div.: D. McLaren, *Supt.*, and George Mansell, *M. M.*.....Chattanooga, Tenn.
J. M. Kelly, *M. C. B.*.....Chattanooga, Tenn.
V. & M. Div.: E. P. Haworth, *Supt.*, and James B. Browne, *M. M.*.....Vicksburg, Miss
V. & S. P. Div.: F. Y. Dabney, *Supt.* Monroe, La
Well Smith, *M. M. & M. C. B.*.....Monroe, La.
New Orleans & North-Eastern R. R.
T. S. Williams, *Supt.*.....New Orleans, La.
I. W. Fowler, *M. M. & M. C. B.*.....Meridian, Miss.
Cincinnati Northern Ry. (*See Tol., Cin. & St. L.*
Cincinnati Selma & Mobile R. R. & P. Co.: H. Elhart, Pas. A. McCollister, *Supt.*.....Selma, Ala.
H. L. Wright, *Pur. Agt.*.....Selma, Ala.
J. M. Lewis, *M. M.*.....Marion, Ala.
Cincinnati, Van Wert & Michigan R. R.
4-9 g. 81 m. 7 lo. 168 cars.
E. C. Dawes, *Gen. Man.*.....Van Wert, O.
D. R. Innis, *Supt. & T. A.*.....Van Wert, O.
Jno. L. Behan, *M. M. & M. C. B.* Van Wert, O.
Cin., Wabash & Mich. Ry. 4-8½ g. 103 m. 13 lo. 402 c.
Norman Beckley, *Gen. Man.*.....Ft. Wayne, Ind.
O. W. Lamport, *Supt.*.....Wabash, Ind.
S. S. Tinker, *M. M. & M. C. B.*.....Wabash, Ind.
Cin., Wash. & Balt. 4-8½ g. 312 m. 65 lo. 1,422 cars
Jas. H. Stewart, *Gen. Man.*.....Cincinnati, O.
Edw. Evans, *M. M.*.....Chillicothe, O.
T. G. Duncan, *Supt. Car Dept.*.....Zaleski, O.
Cincinnati, Wheeling & New York R. R. 4-8½ g. 111 m.
Thos. R. Sharp, *Pres.*.....New York N. Y.
Cincinnati & Eastern Ry. 3 g. 100 m. 7 lo. 133 cars.
S. Woodward, *Gen. Man.*.....Cincinnati, O.
G. H. Wilber, *Gen. Sup. & Pur. Agt.* Cincinnati, O
P. W. Naughton, *M. M.*.....Newtown, O.
Cincinnati & South-Eastern Ry. 4-8½ g. 18 m.
John V. Patton, *Gen. Man.*.....Newport, Ky.
Clarksburg, Weston & Glenville R. R.
3 g. 36 m. 3 lo. 45 cars.
A. H. Kunst, *Pres. & Gen. Man.* Weston, W. Va.
Sam. A. Steel, *M. M.*.....Weston, W. Va.
P. Dillie, *M. C. B.*.....Nottingham, O.
Cleveland, Columbus, Cincinnati & Indianapolis & St. Louis R'y. and Dayton & Union R. R. 4-8½ g. 785 m. 32 lo. 2,084 cars.
E. B. Thomas, *Gen. Man.*.....Cleveland, O
L. J. Yale, *Pur. Agt.*.....Cleveland, O.
W. W. Turrell, *Gen. M. M.*.....Cleveland, O.
Col. & Cin. Div.: Robt. Illee, *Supt.* Cleveland, O
Wm. Garsting, *M. M.*.....Cleveland, O.
A. G. Steinbrenner, *G. For. Car Dept.* do.
Ind'p'lis Div.: John O. Ewan, *Supt.* Ind'p'lis, Ind
T. W. Ranson, *M. M.*.....Ind'p'lis, Ind
N. Mark, *G. For. Car Dept.* Brightwood, Ind.
Ind. & St. L. Ry.: Tho. Hunter, *Supt.*.....St. Louis, Mo.
T. W. Ranson, *M. M. & C. B.* Brightwood, Ind
Day. & Cin. Rd.: J. H. Barrett, *Supt.* Cincinnati, O
Jas. Gordon, *For. & Locomotive*.....Dayton, O.
Cleveland, Delphos & St. Louis R. R.
3 g. 56 m. 3 lo. 90 cars.
I. H. Burgoon, *Gen. Man.*.....Delphos, O.
B. P. Marshall, *M. M.*.....Delphos, O.
Cleveland, Indiana & St. Louis R. R.
4-8½ g. 19 m. 2 lo. 20 cars.
J. A. Larned, *Rec. of Receivers*.....Anderson, Ind.
Cleveland, Mt. Vernon & Delaware R. R.
4-8½ g. 144 m. 24 lo. 838 c.
N. Monnett, *Gen. Sup.*.....Akron, O.
G. M. Taylor, *M. M. & C. B.*.....Mt. Vernon, O.
Cleve., Cyngonnati & Chic. R. R. 3 g. 30 m. 138 c.
D. T. Lumley, *Gen. Supt.*.....Alliance, O.
C. H. Dorman, *M. M. & M. C. B.*.....Alliance, O.
Cleveland, Lorain & Wheeling Ry.
4-8½ g. 158 m. 31 lo. 1,878 cars.
Oscar Townsend, *Gen. Man.*.....Cleveland, O.
Wm. Thornburg, *Supt.*.....Lorain, O.
W. A. Stone, *M. M.*.....Lorain, O.
Cleve. & Marietta R. R. (*See Wheel. & Cleve.*)
Cleveland & Pittsburg (*See Penna. Co.*) (*4th Div.*)
Clifton & Port Hudson R. R. 3 g. 30 m. 138 c.
D. W. Pipes, *Supt.*.....Clinton, La.
W. F. Lockwood, *M. M.*.....Clinton, La.
Clove Branch R. R. 4-8½ g. 4 m. 1 lo. 50 cars.
C. L. Kimball, *Supt.*.....Mattewan, N. Y.
W. Vanbaskirk, *M. M.*.....Dutchess Jc., N. Y.
Coburg, Peterborough & Marmora Ry.
5-6 g. 47 m. 5 lo. 255 cars.
Jas. R. Barker, *Gen. Supt.*.....Cobourg, Ont.
Jas. Clark, *M. M.*.....Cobourg, Ont
John Tinney, *M. C. B.*.....Cobourg, Ont.
Colorado Central R. R. (*See Un. Pac.*) (*4th Div.*)
Columbia & Greenville R. R. 4-8½ g. 61 m. 2 lo. (*See also* Charlotte & Puget Sound R.R. 3 g. 31 m. 7 lo. 4 c.
J. L. Howard, *Gen. Supt.*.....San Francisco, Cal.
Columbus, Hocking Valley & Toledo Ry.
4-9 g. 324 m. 90 lo. 7,333 cars.
G. R. Carr, *Gen. Supt.*.....Columbus, O.
W. M. Greene, *Pur. Agt.*.....Columbus, O.
Ira G. Hutchins, *M. M.*.....Columbus, O
J. M. Rockefield, *M. C. B.*.....Columbus, O.
Tol. Div.: M. T. Seymour, *Supt.*.....Columbus, O.
Hock. V. Div.: M. J. Booth, *Supt.* Columbus, O.
Ohio Riv. Div.: C. D. Norris, *Supt.*.....Columbus, O.
Columbus & Eastern R. R. In progress
Columbus & Hocking Coal & Iron Co.....Columbus, O.
Columbus & Maysville Ry. (*See Cin. & East.*
Columbus & Rome R. R. 3 g. 33 m. 3 lo. 90 cars.
Jno. Cowdery.....Cowdery, Ga.
Columbus & Western Ry. 3 g. 80 m. 2 lo. 53 cars.
E. S. Flewellen, *Gen. Man.*.....Opelika, Ala.
R. A. Bridges, *M. M.*.....Opelika, Ala.
Concord & Claremont R. R. 4-8½ g. 141 m. 4 lo. 1,235 cars.
H. E. Chamberlain, *Supt. & P. Agt* Concord, N. H.
J. T. Gordon, *M. M. & C. B.*.....Concord, N. H.
Concord & Claremont R. R. (*See* Boston, Concord & N. H.
Conn. Riv. and Ver. Val. R. Rs. 4-8½ g. 130 m. 42 lo. 554 c.
J. Mulligan, *Asst. of Supt.* Springfield, Mass.
W. H. Swarm, *M. M. & C. B.* Springfield, Mass.
Conn. & Passumpsic Rivers R. R. (*See Passumpsic*)
Connotton Valley R. R. 3 g. 100 m. 10 lo. 967 cars.
Samuel Briggs, *Gen. Man.*.....Cleveland, O.
C. Bosworth, *M. M.*.....Canton, O.
Cooperstown & Susquehanna Valley R. R.
4-8½ g. 16 m. 2 lo. 14 cars.
Andrew Shaw, *Pres.*.....Cooperstown, N. Y.
A. Mumford, *M. M.*.....Cooperstown, N. Y.
Corning, Cowanesque & Antrim Ry. (*See* Fall Brook Coal Co.)
Cornwall R. R. 4-8½ g. 12 m. 5 lo. 166 cars.
J. M. Havard, *G. Supt. & M. M.*.....Lebanon, Pa.
Levi Bisch, *M. C. B.*.....Lebanon, Pa.
Coudersport & Port Allegheny R. R.
3 g. 17 m. 3 lo. 45 cars.
B. A. McClure, *Gen. Supt.*.....Coudersport, Pa.
Credit Valley Ry. 4-8½ g. 184 m. 22 lo. 535 cars.
Wm. Wylie, *Gen. Man.*.....Toronto, Ont.
John Macnab, *Pur. Agt.*.....Toronto, Can.
D. Preston, *Mech. Supt.*.....Toronto, Can.
Crooked Creek R. R. 3 g. 9 m. 1 lo. 57 cars.
Walter C. Willson, *Gen. Man.* Webster City, Ia.
Geo. W. Post, *Pur. Agt.*.....Chicago, Ill.
Crown Point Iron Co. R. R. 3 g. 13 m. 4 lo. 113 c.
A. L. Inman, *Gen. Man.*.....Crown Point, N. Y.
H. L. Reed, *Pur. Agt.*.....Crown Point, N. Y.
J. W. Davies, *Supt. & M. M.* Crown Point, N. Y.
C. C. Sherman, *M. C. B.*.....Crown Point, N. Y.
Cumberland Ry. 4-8½ g. 32 m. 1 lo. 64 c.
J. A. Killam, *Gen. Man.*.....Parsboro, N. S.
K. McKinnon, *M. M.*.....Parsboro, N. S.
Cumberland Valley R. R. 4-9 g. 127 m. 25 lo. 474 cars.
J. F. Boyd, *Supt.*.....Chambersburg, Pa.
A. S. Holl, *M. M.*.....Chambersburg, Pa.
Wicks, *M. C. B.*.....Chambersburg, Pa.
Cumberland & Maurice River R. R. 4-8½ g. 20 m.
L. H. Downey, *Supt.*.....Port Morris, N. J.
Cumberland & Penn. R. R. 4-8½ g. 5 m. 1 lo. 30 cars.
P. L. Burwell, *Gen. Supt & P. A.* Cumberland, Md.
S. W. Howson, *Asst. of Mech.* Mt. Savage, Md.
Nathan Binix, *M. C. B.*.....Mt. Savage, Md.

**D**

Danville & New River R. R. 3 g. 43 m. 2 lo. 90 c.
W. T. Sutherlin, *Gen. Man.*.....Danville, Va.
J. F. Morton, *M. M.*.....Danville, Va.
Danbury & Norwalk R. R. 4-8½ g. 36 m. 2 lo. 112 c.
C. M. Crawford, *G. Supt. & P. A.* S. Norwalk, Ct.
W. H. Wilkinson, *M. M. & C. B.* Danbury, Conn.
Danville, Mockeville & So. Wn. R. R. 3 g. 28 m.
H. M. Shivler, *Supt.*.....Leaksville, N. C.
Danville, Olney & O. R. R. R. 4-8½ g. 110 m. 5 lo. 83 c.
C. E. Henderson, *Rec. & Man.*.....Olney, Ill.
W. A. Bell, *M. M. & M. C. B.*.....Kansas, Ill

Dayton & Union R. R. (*See Cleve., Col., Cin. & Ind.*)
Dayton & Michigan R. R. (*See Cin., Hom. & Day.*)
Del. Lackawanna & W. and N. Y., Lack. & W. R. Rs.
4-8½ g. 930 m. 426 lo. 31,080 cars.
Wm. F. Halstead, *Gen. Supt.*.....Scranton, Pa.
G. W. R. Cushing, *Pur. Agt.*.....New York, N. Y.
Walter Dawson, *Mast. of Mach.*.....Scranton, Pa.
Robt. McKenna, *M. C. B.*.....Scranton, Pa.
Bloomsburg Div.: C. Graham, *M. M.* Kingston, Pa.
Utica Div.: A. C. Salisbury, *Supt.*.....Utica, N. Y.
Thos. Thatcher, *M. M.*.....Utica, N. Y.
Morris & Essex Div.; Sussex; P. & D. and C. R. Rs.
A. Reasoner, *Supt.*.....Hoboken, N. J.
W. H. Lewis, *M. M.*.....Kirkland, N. J.
J. W. Baker, *Mast. Car Rep.*.....Dover, N. J.
Oswego & Syracuse Div.:
W. B. Phelps, *Supt.*.....Oswego, N. Y.
Jas. Buchanan, *M. M.*.....Syracuse, N. Y.
Syracuse, Binghamton & New York R. R.
4-8½ g. 81 m. 20 lo. 598 cars.
W. K. Niver, *Gen. Supt.*.....Syracuse, N. Y.
Jas. Buchanan, *M. M.*.....Syracuse, N. Y.
Cayuga Div.: W. R. Humphrey, *Supt* Ithaca, N. Y.
Delaware, Maryland & Virginia R. R.
4-8½ g. 101 m. 7 lo. 145 cars.
Tho. Conway, *Supt.*.....Lewes, Del.
Geo. Messick, *M. M.*.....Lewes, Del.
W. H. Virden, *M. C. B.*.....Lewes, Del.
Delaware River R. R. 4-8½ g. 30 m. 3 lo. 4 cars.
E. H. Green, *Supt.*.....Pedricktown, N. J.
Delaware Western R. R. (*See Erie & Pitts.*)
Delaware & Chesapeake R. R. (*See Penna.*) (*4 Div.*)
Delaware & Hudson Canal Co.
4-3 and 4-8½ g. 934 m. 180 lo. 10,709 cars.
C. F. Young, *Gen. Man.*.....Honesdale, Pa.
C. F. Young, *Pur. Agt.*.....Honesdale, Pa.
R. C. Blackall, *Supt. of Mach.*.....Albany N. Y.
Susq. Div.: C. D. Hammond, *Supt.* Albany, N. Y.
Tho. Howard, *M. M.*.....Carbondale, Pa.
J. B. Skinner, *M. C. B.*.....Oneonta, N. Y.
Sar. & Ch. Divs.: T. Voorhees, *Supt.*.....Troy, N. Y.
J. L. Corey, *M. M.*.....Green Island, N. Y.
Chr. Körner, *M. C. B.*.....Green Island, N. Y.
Pa. Div.: R. Manville, *Supt. & Pur. Agt.* and S. H. Dotterer, *M. M.*.....Carbondale, Pa.
D. Graham, *M. C. B.*.....Honesdale, Pa.
Denver Circle R. R. 3 g. 6 m. 3 lo. 15 cars.
Theo. C. Henry, *Gen. Man.*.....Denver, Col.
J. H. Bedon, *Gen. Supt.*.....Denver, Col.
Denver, Utah & Pacific R. R. 3 g. 34 m. 2 lo. 58 c.
L. M. Fouts, *Supt.*.....Denver, Col.
Denver & New Orleans. 4-8½ g. 140 m. 11 lo. 400 c.
W. Fisher, *Gen. Man.*.....Denver, Col.
Chas. Wheeler, *Pur. Agt.*.....Denver, Col.
J. H. Kirk, *M. & M. C. B.*.....Denver, Col.
Denver & Rio Grande R. R. 3 g. 1,065 m. 225 lo. 5,367 c.
D. C. Dodge, *Gen. Man.*.....Denver, Col.
C. M. Hobbs, *Pur. Agt.*.....Denver, Col.
S. W. Sample, *Gen. M. & M.*.....Denver, Col.
(1) Col. & N. M. Div.: R. E. Ricker, *G. S.* Denver, Col.
1st Div.: W. W. Borst, *Supt.*.....Trinidad, Col.
2d Div.: Cole Lydon, *Supt.*.....Alamosa, Col.
3d Div.: G. W. Cook, *Supt.*.....Leadville, Col.
4th Div.: B. M. Ridgway, *Supt.*.....Salida, Col.
(2) Utah Div.: W. H. Bancroft, *G. S.* Lake City, Utah.
Des Moines, Iowa & Minn. R. R.
3 g. 100 m. 7 lo. 253 cars.
Henry Stivers, *Gen. Supt.*.....Osceola, Ia.
L. D. Berry, *M. M.*.....Osceola, Ia.
Elias Tonet, *M. C. B.*.....Osceola, Ia.
Des Moines & Ft. Dodge. 4-8½ g. 144 m. 13 lo. 505 c.
C. N. Gilmore, *Supt.*.....Des Moines, Ia.
John McGrayel, *M. M.*.....Grand Junction, Ia.
E. A. Avery, *M. C. B.*.....Grand Junction, Ia.
Det., Bay City & Alpena R. R. 3-2 g. 48 m. 3 lo. 227 c.
Miles Eastman, *Supt.*.....Detroit, Mich.
Det., Gr. H. & Mil. Ry. 4-8½ g. 189 m. 39 lo. 606 c.
G. R. Nash, *Gen. Man.*.....Detroit, Mich.
John S. Lawrence, *Engineer*.....Detroit, Mich.
W. J. Morgan, *Supt.*.....Detroit, Mich.
H. Roberts, *Mech. Supt.*.....Ft. Gratiot, Mich.
Det., Lansing & No'n R. R. 4-8½ g. 222 m. 84 lo. 1027 c.
John B. Hulliken, *Gen. Man.*.....Detroit, Mich.
Allan Bourn, *Pur. Agt.*.....Detroit, Mich.
Thos. M. Fish, *Gen. Supt.*.....Ionia, Mich.
Jas. Dalton, *M. M.*.....Ionia, Mich.
Det., Mack. & Marq. R. R. 4-8½ g. 152 m. 16 lo. 1,112 c.
D. McCool, *Gen. Supt. & P. A.* Marquette, Mich.
Dorchester & Delaware R. R. (*See Penna.*) (*4d. Div.*)
Dubuque & Dakota R. R. 4-8½ g. 64 m. 2 lo. 24 cars.
A. C. Goodrich, *Supt.*.....Waverly, Ia.
W. S. Couch, *Pur. Agt.*.....Dubuque, Ia.
Duck River Valley R. R. (*See Nash., Chat. & St. L.*)
Dunkirk, Allegheny Valley & Pittsburgh R. R.
4-8½ g. 14 m. 1 lo. 10 cars.
D. Thayer, *Gen. Supt.*.....Dunkirk, N. Y.
R. C. Moore, *Pur. Agt.*.....New York, N. Y.
C. J. Haggett, *M. & C. B.*.....Dunkirk, N. Y.

**E**

East Alabama Ry. 5 g. 22 m. 3 lo. 19 cars.
A. W. Barnes, *Supt.*.....Opelika, Ala.
East Broad Top R. R. 3 g. 30 m. 7 lo. 290 cars.
A. W. Sims, *Supt.*.....Orbisonia, Pa.
A. W. Greenwood, *M. M.*.....Orbisonia, Pa.
East St. Louis & Carondelet Ry. 4-8 g. 4 lo. 27 c.
Joseph Hill, *Gen. Supt.*.....East St. Louis, Ill.
East Tenn. & Western North Car. R. R.
3 g. 54 m. 5 lo. 200 cars.
Thomas E. Matson, *Supt.* Elizabethton, Tenn.
East Tennessee, Virginia & Georgia R. R.
5 g. 1,455 m. 173 lo. 5,000 cars.
Henry Fink, *V. P. & Gen. Man.* Knoxville, Tenn.
J. F. O'Brien, *Gen. Sup. & P. A.*.....Knoxville, Tenn.
J. E. Wilcox, *Pur. Agt.*.....Knoxville, Tenn.
East Tenn. Div. and No. Car. and Ohio Branches:
F. K. Huger, *Supt.*.....Knoxville, Tenn.
B. J. Sitton, *M. M.*.....Knoxville, Tenn.
W. W. Pierce, *M. C. B.*.....Knoxville, Tenn.
Alabama Div.: J. M. Bridges, *Supt.*.....Selma, Ala.
Simon Gay, *M. M.*.....Selma, Ala.
W. W. Pierce, *M. C. B.*.....Selma, Ala.
Memphis & Charleston R. R. (Div.):
H. B. Pegram, *Jr., Supt.*.....Memphis, Tenn.
H. N. Burford, *M. M.*.....Memphis, Tenn.
Atlanta Div.: W. Fry, *Supt.*.....Atlanta, Ga.
M. J. Rogers, *M. M.*.....Atlanta, Ga.
J. H. Perkins, *M. C. B.*.....Atlanta, Ga.
Brunswick Div.: J. D. Mallory, *Supt.* Macon, Ga.
East & West R. R. of Ala. 3 g. 110 m. 9 lo. 85 c.
John Postell, *Manager*.....Cedartown, Ga.
M. F. C. Pierce, *M. C. B.*.....Cedartown, Ga.
Easton R. R. 4-8½ g. 283 m. 110 lo. 2,308 cars.
Payson Tucker, *Gen. Man.*.....Boston, Mass.
D. W. Sanborn, *Mast. of Trans.* Boston, Mass.
C. H. Spaulding, *M. M.*.....Boston, Mass.
Amos Pillsbury, *S. M. P. & M. E.* Boston, Mass.
J. D. Billings, *G. For. Car Dept.*.....Salem, Mass.
Con. Div.: J. W. Coughlin, *Supt.*.....Easton, N. H.
Eastern Kentucky R. R. 4-8½ g. 34 m. 5 lo. 160 c.
H. W. Bates, *Man. & Pur. Agt.*.....Kentucky, Ky.
H. W. Crawford, *M. M.*.....Hunnewell, Ky.
Eastern (Maine) R. R. (*See Maine Central.*)
Eastern Shore R. R. 4-8½ g. 38 m. 2 lo. 9 cars.
W. Thompson, *Supt.*.....Princess Anne, Md.
F. Thompson, *M. C. B.*.....Princess Anne, Md.
Elberton Air-Line R.R. (*See Rich. & Dan.*)
Elizabeth City & Norfolk R. R. (*See Norfolk So.*)
Elizabethtown & Big Sandy R. R. (*See Ches. & Ohio.*)
Emmitsburg R. R. (*See Penna.*)
Erie & Pittsburg R. R. (*See Penna. Co.*) (*3d. Div.*)
Eureka Springs Ry. 4-8½ g. 19 m. 1 lo. 9 cars.
Powell Clayton, *Gen. Man.* Eureka Springs, Ark.
Eureka & Palisade R. R. 3 g. 27 m. 3 lo. 125 cars.
B. Gilman, *Gen. Sup't & Pur. Agt.* Eureka, Nev.
J. M. Crary, *M. M.*.....Palisade, Nev.
A. S. Longley, *M. C. B.*.....Palisade, Nev.
European & North American R. R. (*See Maine Cen.*)
Evansville, Rockport & Ft. Ry. 4-9 g. 47 m. 4 lo. 200 c.
H. L. Shepard, *Supt.*.....Evansville, Ind.
Evansv. & Terre Haute. 4-8½ g. 169 m. 30 lo. 973 c.
D. J. Mackey, *Gen. Supt.*.....Evansville, Ind.
John Torrance, *M. M.*.....Evansville, Ind.

**F**

Fitchburg R. R. 4-8½ g. 153 m. 100 lo. 3,430 cars.
John Adams, *Gen. Supt.*.....Boston, Mass.
F. S. Pratt, *Pur. Agt.*.....Boston, Mass.
G. A. Coolidge, *Supt. M. P.*.....Boston, Mass.
W. A. Foster, *Asst. Supt. M. P.*.Fitchburg, Mass.
J. W. Marden, *M. C. B.*.....Charlestown, Mass.
Flint & Pere Marq. 4-8½ g. 340 m. 72 lo. 2,100 cars.
H. C. Potter, *Gen. Man.*.....E. Saginaw, Mich.
D. Edwards, *Asst. Gen. Man.*.....E. Saginaw, Mich.
G. G. Cook, *Pur. Agt.*.....E. Saginaw, Mich.
Sanford Keeler, *Gen. Supt.*.....E. Saginaw, Mich.
W. F. Potter, *Supt.* (E. Div.).....E. Saginaw, Mich.
M. V. Meredith, *Supt.* (W. Div.).....E. Saginaw, Mich.
T. J. Hatswell, *M. M.*.....E. Saginaw, Mich.
R. McPherson, *M. C. B.*.....E. Saginaw, Mich.
Florida Ry. & Nav. Co. 5 g. 488 m. 31 lo. 307 c.
D. E. Maxwell, *Gen. Supt.*.....Fernandina, Fla.
R. V. Dohoney, *M. M. & C. B.* Fernandina, Fla.
Florida Southern Ry. 3 g. 91 m. 6 lo. 90 cars.
Sherman Conant, *Gen. Man.*.....Palatka, Fla.
D. B. Hollister, *Gen. Sup.*.....Palatka, Fla.
Fonda, Johnst'n & Gloversv. 4-8½ g. 20 m. 5 lo. 35 c.
Lawton Caten, *Supt.*.....Gloversville, N. Y.
G. Y. Putnam, *M. M.*.....Gloversville, N. Y.
Fond du Lac, Amboy & Peoria. 3 g. 30 m. 2 lo. 35 c.
Alonzo Kinyon, *Supt. & P. A.* Fond du Lac, Wis.
Fort Dodge & Fort Ridley R. R. (*See Minn. & St. L.*)
Franklin & Prov. & Hopkinton.
E. P. Ware, *Supt.*.....Milford, Mass.
Ft. Madison & No. West'n Ry. 3 g. 45 m. 3 lo. 127 c.
R. S. Rarick, *Supt. & Pur. Agt.* Ft. Madison, Ia.
I. L. Lamb, *M. M. & C. B.*.....Ft. Madison, Ia.
Ft. Wayne, Cin. & Louisv. 4-8½ g. 128 m. 12 lo. 500 c.
White Water R. R. 4-8½ g. 65 m. 5 lo. 170 cars.
W. W. Worthington, *Gen. Supt.*.....Ft. Wayne, Ind.
Alonzo Kinyon, *Supt. & P. A.* Fond du Lac, Wis.
Wm. Knight, *M. C. B.*.....Ft. Wayne, Ind.
Fort Worth & Denver City Ry.
4-8½ g. 114 m. 8 lo. 443 cars.
C. L. Frost, *Supt.*.....Fort Worth, Tex.
Freehold & New York. 4-8½ g. 15 m. 4 lo. 40 c.
J. E. Ralph, *Supt. & Pur. Agt.*.....Keyport, N. J.
M. G. Mount, *M. M. & C. B.*.....Freehold, N. J.
C. H. Snedeker, *M. C. B.*.....Freehold, N. J.
Fulton County N. G. Ry. 3 g. 61 m. 4 lo. 168 cars.
A. C. Atherton, *Gen. Supt. & P. Agt.* Lewiston, Ill.

**G**

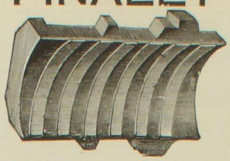
Gainesville & Dahlonega R. R. 3 g. 15 m.
W. P. Price, *Pres.*.....Dahlonega, Ga.
Gainesville, Jefferson & Southern R.R. (*See Geo. Pac.*)
Gal., Harrisburg & San Antonio Ry. (*See Gen. Pac.*)
Galveston, Houston & H. R. (*See Mo. Pac.*) (*5 Div.*)
Galveston, Sabine & St. Louis Ry.
4-8½ g. 15 m. 2 lo. 27 cars.
Brad. Longview, *Gen. Man.*.....Longview, Tex.
Chas. H. Jewell, *Supt.*.....Longview, Tex.
Geneva, Ithaca & Sayre R. R. (*See Lehigh Val.*)
George's Creek & Cumberland R. R.
4-9 g. 25 m. 6 lo. 212 cars.
J. A. Mulholland, *Gen. Man.*.....Cumberland, Md.
Georgetown & Lake's R. R. 5 g. 36 m. 2 lo. 52 c.
John Barle, *Gen. Supt.*.....Silverton, Col.
Georgia R. R. 5 g. 307 m. 42 lo. 1,017 cars.
John W. Green, *Gen. Man.*.....Augusta, Ga.
Jno. Gumming, *Gen. Sup.*.....Augusta, Ga.
T. M. Preval, *M. C. B.*.....Augusta, Ga.
Georgia Pine R. R.
W. Y. Sage, *Gen. Supt.*.....Birmingham, Ala.
S. H. Purcell, *Div. Supt.*.....Greenville, Miss.
W. T. Newman, *M. M.*.....Greenville, Miss.
J. B. Shelton, *M. C. B.*.....Greenville, Miss.
Grand Haven & Muskegon R. R. (*See S. Haven & W. Mich.*)
Grand Junction Ry. (*See Midland of Can.*)
Grand Rapids, Indiana & Mackinaw. (*See Gr. R. & I.*)
Grd'd Rapids & Ind. R. R. 4-8½ g. 177 m. 8 lo. 1,724 c.
Grand Rapids & Indiana. 4-8½ g. 328 m. 52 lo. 1,724 c.
W. O. Hutchinson, *Gen. Man.*.....Grand Rapids, Mich.
W. R. Shelby, *Pur. Agt.*.....Grand Rapids, Mich.
S. D. Bradley, *M. M.*.....Grand Rapids, Mich.
No'n Div.: M. Metheany, *Asst. Supt.* Ft. Gratiot, Mich.
So'n Div.: P. S. O'Rourke, *Supt.* Fort Wayne, Ind.
Grand Southern R. R. 3 g. 30 m. 2 lo. 60 cars.
4-8½ g. 82 m. 5 lo. 54 cars.
J. N. Greene, *Gen. Man.*.....St. George, N. B
G'd Trunk R. R. 4-8½ g. 1,135 m. 8 lo. 307 c.
Thomas Logan, *M. M.*.....St. George, N. B
Grand Trunk Railway. 4-8½ g. 1,135 m. 8 lo. 307 c.
T. M. Williamson, *Supt. & P. A.* Gr. Tower, Ill.
Hugh Smith, *M. M. & C. B.*.....Grand Tower, Ill.
Grand Trunk Riv. 4-8½ g. 6 m. 1 lo. 20 cars.
Joseph Hickson, *Gen. Man.*.....Montreal, Can.
Wm. Wainwright, *Asst. Gen. Man.*.....Montreal, Can.
Mont. Div.: W. J. Spicer, *Supt.* Montreal, Can.
Jno. Taylor, *Gen. Storekeeper* Montreal, Can.
Herbert Wright, *Gen. Car Agt.*.....Montreal, Can.
Wm. McWood, *Supt. Car Dept.* Montreal, Can.
J. Hazard, *Pur. Agt.*.....Montreal, P. Q.
Gt. West'n Div.: Chas. Stiff, *Supt.* Hamilton, Ont.
E. Baines, *Store Kpr.*.....London, Ont.
C. K. Lonsly, *Mech. Supt.* Hamilton, Ont.
C. F. Hanson, *Lo. Pur.*.....London, Ont.
J. G. Holtzwain, *Supt. Car Dept.*.....London, Ont.
Chi. & Gr. Trunk R. R. 4-8½ g. 330 m. 103 lo. 1,191 c.
*Gen. Man.*.....Chicago, Ill.
W. H. Pettibone, *Gen. Supt.*.....Battle Creek, Mich.
A. Judd, *Pur. Agt.*.....Fort Gratiot, Mich.
H. Roberts, *Mech. Supt.*.....Ft. Gratiot, Mich.
Midland Div. 4-8½ g. 471 m. 44 lo. 1,423 c.
W. B. Ferguson, *Supt.*.....Peterboro, Ont.
J. D. Barnet, *Mech. Superintendent*.....Peterboro, Ont.
Grand Trunk, Georgian Bay & Lake Erie Ry. (*See G. T.*)
Great Western Ry. (*See Grand Trunk; G. W. Div.*)
Green Bay, Winona & St. Paul R. R.
4-8½ g. 250 m. 19 lo. 623 cars.
Timothy Burke, *Gen. Man.*.....Green Bay, Wis.
A. Fenwick, *M. M.*.....Ft. Howard, Wis.
Green Cove Spring & Melrose R.R. 3 g. 32 m. 1 lo. 11 c.
S. A. Hull, *Supt.*.....Green Cove Springs, Fla.
Greenwich & Johnsonville Ry. 4-8½ g. 15 m. 1 lo. 7 c.
C. J. Thompson, *Supt.*.....Greenwich, N. Y.
Gulf, Col. & Santa Fé Ry. 4-8½ g. 536 m. 43 lo. 1,400 c.
Webster Snyder, *Gen. Man.*.....Galveston, Texas.
F. P. Sabin, *Supt.*.....Galveston, Texas.
Jno. W. Thorne, *Pur. Agt.*.....Galveston, Texas.
G. B. Scott, *M. M.*.....Galveston, Texas.
Gulf, W'n Texas & Pac. Ry. 4-8½ g. 68 m. 6 lo. 74 c.
M. D. Mousteratt, *Pur. Agt.* and *M. M.* Cuero, Tex.
James Mooney, *M. M.*.....Cuero, Texas.

**H**

Hannibal & St. Jo. R. R. 4-8½ g. 292 m. 76 lo. 1,906 c.
J. F. Barnard, *Gen. Man.*.....Chicago, Ill.
T. L. Dunn, *Gen. Sup.*.....Hannibal, Mo.
Wm. Irving, *Pur. Agt.*.....Hannibal, Mo.
Sedwick Salomon, *G. For. Car Dep.* Hannibal, Mo.
Chas. Coller, *For. Car Dept.*.....Hannibal, Mo.
Hanover Branch R. R. 4-8½ g. 8 m. 2 lo. 18 cars.
R. C. Perry, *Supt.*.....North Hanover, Mass.
Hanover Junction, Hanover & Gettysburg R. R.
4-8½ g. 20 m. 3 lo. 140 cars.
H. D. Scott, *Gen. Supt.*.....Gettysburg, Pa.
John J. Bingley, *M. M.*.....Hanover, Pa.
Jno. Bingley, *M. C. B.*.....Hanover, Pa.
Harrisburg & Potomac R. R. 4-8½ g. 35 m. 3 lo. 35 c.
H. W. Bates, *Man. & Pur. Agt.*.....Kentucky, Ky.
Hartford & Conn. Val. R. R. 4-8½ g. 47 m. 9 lo. 190 c.
O. M. Shepard, *Asst. Supt.*.....New Haven, Ct.
John Brown, *M. M.*.....Hartford, Ct.
Hartford & Conn. W'n R. R. 4-8½ g. 110 m. 16 lo. 468 c.
John G. Jones, *Gen. Man.*.....Hartford, Ct.
J. C. Barton, *M. M.*.....Hartford, Ct.
Hartwell R. R. (*See Rich. & Dan.; N. G. Ry.*)
Hecla & Torch Lake R. R. 4-4 g. 5 m. 1 lo. 570 c.
W. A. Childs, *Gen. Man.*.....Calumet, Mich.
Herkimer, Newport & Poland Ry.
3-6 g. 17 m. 2 lo. 24 cars.
Albert Wilber, *Supt.*.....Herkimer, N. Y.
Hobart & Marlboro River R. R. 3 g. 9 m. 2 lo. 42 c.
H. W. Marsh, *Supt.*.....Hobart, Mich.
Hot Springs R. R. 3 g. 25 m. 3 lo. 77 cars.
J. N. Conger, *Supt.*.....Hot Springs, Ark.
C. Finley, *M. M.*.....Malvern, Ark.
Housatonic R. R. 4-8½ g. 120 m. 35 lo. 671 cars.
W. H. Yeomans, *Supt.*.....Bridgeport, Ct.
D. S. Draper, *Pur. Agt.*.....Bridgeport, Ct.
S. Slingland, *M. M.*.....Falls Village, C.
J. J. Ferris, *M. C. B.*.....Falls Village, C.
Houston Belt Ry. 4-3½ and 3 gauge 10 miles.
S. L. Werden, *V. P. & Gen. Man.* Houston, Tex.
Houston, East & West Tex. Ry. 3 g. 156 m. 10 lo. 570 c.
Paul Bremond, *Pr. & Pur. Agt.*.....Houston, Tex.
R. L. Brymond, *Gen. Man.*.....Houston, Tex.
R. O. Duffey, *M. M.*.....Houston, Tex.
C. F. Schelewa, *M. C. B.*.....Houston, Texas.
Houston & Tex. Cen. Ry. 4-8½ g. 750 m. 78 lo. 2,526 c.
J. Waldo, *V. Pr. & Gen. Man.*.....Houston, Tex.
A. H. Swanson, *Gen. Sup.*.....Houston, Tex.
*Pur. Agt.*.....New York, N. Y.
L. C. Noble, *Gen. M. M.*.....Houston, Tex.
Tymes McGee, *M. C. B.*.....Houston, Tex.
So. & W. Divs.: M. G. Howe, *Supt.* Houston, Tex.
No. & St. Divs.: G. A. Quinlan, *Supt.*, and C. H. Burns, *Asst. M. M.*.....Corsicana, Tex.
No.-Wn. Div.: Donald Allen, *Supt.*.....Waco, Tex.
Humestown & Shenandoah R. R.
4-8½ g. 113 m. 18 lo. 80 cars.
F. O. Wyatt, *Gen. Man.*.....Clarinda, Ia.
C. H. Warren, *Supt.*.....Clarinda, Ia.
W. B. Snyder, *M. M.*.....Shenandoah, Ia.
Huntington & W. Va. R. R. 4-8½ g. 62 m. 18 lo. 60 c.
Geo. F. Gage, *Gen. Man.*.....Huntington, Pa.
Samuel B. Kemp, *Pur. Agt.* Philadelphia, Pa.
William Barkla *M. M.*.....Saxton Pa.

**I**

Illinois Central R. R. 4-8½ g. 1,928 m. 334 lo. 8,565 c.
E. T. Jeffery, *Gen. Sup.*.....Chicago, Ill
O. Ott, *Pur. Agt.*.....Chicago, Ill
Henry Schlacks, *Supt. of Mach.*.....Chicago, Ill.
W. B. Snow, *M. M. Car

# LE ROY FINALLY  VICTORIOUS.

The following is the FINAL decision of the Patent Office in the matter of the Interference of HOPKINS vs. LE ROY, renuered August 31, 1883

*It is falsely pretended that our invention infringes an alleged patent held by Mr. Hopkins. We hereby offer* **$2,500** *to Mr. Hopkins if he will commence and prosecute in good faith an action against us to settle the point; and, as we believe he has no valid patent, we stand ready to manufacture and sell his brasses in order that he may sue us. See Babbitt Patent, Sept. 4, 1840, and Joseph Gordman, March 12, 1861. GEORGE W. McLEAN, President.*

'COPY.'

Department of the Interior, United States Patent Office
Washington, D. C., Sept. 1, 1883.

'In the matter of the interference of
HOPKINS vs. LE ROY.
On Appeal to the Commissioner.

'For a Journal Box composed of Hard and Soft Metal, the SOFT METAL BANDS PROJECTING ON THE JOURNAL BEARING SIDE BEYOND THE SURFACE OF THE HARD METAL, Priority of Invention Must be Awarded to LE ROY."

By direction of the Commissioner.
Very respectfully,
(Signed) SCHUYLER DINGEE, Chief Clerk.

To T. V. LE ROY, Care John R. Bennett, No. 237 Broadway.
George Harding, Counsel.

Thus reversing all former decisions made in favor of HOPKINS, dissolving the interference heretofore declared in his favor, and sustaining the validity of the LE ROY Patent and every claim made by LE ROY for his Invention.

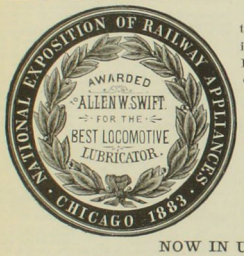
## LE ROY JOURNAL BEARING CO.,

145 Broadway, New York City. GEO. W. McLEAN, President.

# THE "SWIFT" AUTOMATIC LUBRICATOR.

A PERFECT MACHINE FOR THE INTERNAL LUBRICATION OF THE

## LOCOMOTIVE, MARINE & STATIONARY ENGINES.

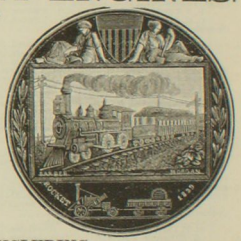



This device delivers any desired quantity to each cylinder POSITIVELY, and its feed-rate remains unchanged with the Engine at FULL STROKE, THROTTLED or REVERSED.

Will feed any ordinary Lubricant from the lightest oils to the

**HARDEST TALLOW**

IN THE COLDEST WEATHER.



## Positive Feed, Flash "Sight."

NO EXTERNAL OR INTERNAL PIPES.

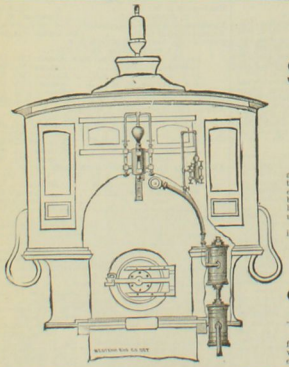
NO GLASS TUBES OR LOOSE JOINTS.

Approved by the Eastern and Western R. R. Association.

NOW IN USE ON THE LEADING RAILROADS IN THE COUNTRY, INCLUDING
Pennsylvania R. R., Union Pacific R. R., New York, West Shore & Buffalo, Chicago & Alton, Lehigh Valley, Delaware, Lackawanna & Western R. R.

CORRESPONDENCE SOLICITED.

"SWIFT" LUBRICATOR COMPANY, ELMIRA, N. Y.



## THE DETROIT LUBRICATOR COMPANY'S

# SIGHT FEED LUBRICATORS,

## For Locomotive Cylinders and Air-Pumps.

The attention of railroad men is invited to the Detroit Lubricator Co.'s Patent Sight Feed Lubricators, for oiling locomotive valves and cylinders, and the Westinghouse Air Pump. Both cups are placed within the cab. The valve cup has a double sight feed, each of which is connected to the right and left hand steam chests, by means of the so-called "tallow pipes," running beneath the jacket, thus securing *independent lubrication to each steam chest and cylinder from the one cup.* The oil is shown passing in drops through each sight feed glass to the parts to be lubricated, and can be regulated to feed fast or slow. *The feed is regular and continuous, going up or down grade, whether pressure is on or off,* thus securing perfect lubrication at all times. What is said in reference to the valve cup, is equally true in regard to our lubricator for the Westinghouse Pump. By the use of these cups, the saving in wear and tear of machinery and the additional power gained is simply wonderful, as is proved by actual results.* We solicit a practical test, and will send one or more valve and air-brake cups to responsible parties on 30 days' trial. Details and drawings showing manner of attachment and prices furnished on application.

DETROIT LUBRICATOR CO.

Office: 129 GRISWOLD ST., - - - DETROIT, MICH.

* Numerous examples can be furnished where engines have run *two years and over, without having had their valves faced.* The average mileage for the air-brake lubricator is 500 to 1,500 miles to the ½ pint, and examples can be given where this mileage has been greatly exceeded, among which is one of 1,012 *miles with a ½ pint* of oil on a daily run of 208 miles with 64 stops. This pump has run *nine months without having had* 25 *cents expended on it for repairs.*

## "CHAMPION" RAILWAY PADLOCKS

For Cars, Switches, Tool Boxes, etc.

In Sets to Order. As Many as 500 in a Set if Required.

Each Lock has two SPECIAL KEYS, which unlock no other; or all locks may be made to pass the same key.

Each set may be provided with one MASTER KEY, which unlocks the whole set.

FOR ILLUSTRATED PRICE-LIST, ADDRESS

FAIRBANKS & CO., New York; Albany, N. Y.; Buffalo, N. Y.; Philadelphia, Pa.; Pittsburgh, Pa.; Baltimore, Md. and New Orleans La.

ATTENTION!

## CAR ROOFERS & CAR-BUILDERS.

If you wish to use a first-class article of Tin Roofing, write to

## N. & C. TAYLOR CO.,

PHILADELPHIA,

and get their price on the only **Redipped** or **Extra Coated** Roofing Tin made. The brand on the boxes is

"OLD STYLE"

**Double Coated Roofing Tin.**

All the prominent roofers are using it. Send for samples and prices.

Lake Erie & Western Ry. 4-8½ g. 388 m. 53 l.s. to 1,701 c.
J. H. Cheney, *Gen. Man.* ..... Bloomington, Ill.
D. S. Hill, *Gen. Supt.* ..... Bloomington, Ill.
T. H. Perry, *Pur. Agt.* ..... Bloomington, Ill.
H. L. Cooper, *Supt. of Equipment*..... Lima, O.
Lake George & Muskegon River R. R.
4-8½ g., 20 m., 4 lo. 79 cars.
W. S. Gerrish, *Gen. Man.*.. Muskegon, Mich.
Lake Shore & Michigan So'n Ry.
4-8½ g. 1,340 m. 347 l.s. 17,115 cars.
John Newell, *Gen. Man.* ..... Cleveland, O.
P. P. Wright, *Gen. Supt.* ..... Cleveland, O.
A. C. Armstrong, *Pur. Agt.* ..... Cleveland, O.
G. W. Stevens, *Supt. M. P.* ..... Cleveland, O.
John Kirby, *Gen. M. C. B.* ..... Cleveland, O.
East'n Div.: C. B. Couch, *Supt.*... Cleveland, O.
J. S. Graham, *M. M.* ..... Buffalo, N. Y.
A. C. Robson, *M. M.* ..... Buffalo, N. Y.
L. O. Gassett, *M. M.* ..... Cleveland, O.
J. Withycombe, *M. C. B.* ..... Cleveland, O.
Frank Div.: G. H. McIntire, *Supt.*Youngstown, O.
Toledo Div.: Thos. Flesher, Jr., *Supt.*Cleveland, O.
J. M. Sanborn, *M. M.* ..... Norwalk, O.
W. O. Smith, *M. C. B.* ..... Norwalk, O.
Mich. Div.: J. E. Curtis, *Supt.* ..... Detroit, O.
Det. Brs.: T. J. Charlesworth, *Supt.* Detroit, Mich.
Lansing, Ypsilanti & Ft. Wayne Branches.
W. Caniff, *Supt.* ..... Detroit, Mich.
Western Div.: A. G. Amsden, *Supt.*.. Chicago, Ill.
W. L. Gilmore, *M. M.* ..... Elkhart, Ind.
Frank O. Bray, *M. C. B.* ..... Adrian, Mich.
Gr. Rap. Br.: M. E. Wattles, *Supt.*Kalamazoo, Mich.
Lake Shore R. R.
4-8½ g. 120 m. 2 l.s. 10 cars.
D. L. Bliss, *Gen. Man.* ..... Carson, Nev.
John T. Rogers, *Gen. Supt.* ..... Carson, Nev.
Geo. R. Lindsay, *M. M.* ..... Carson, Nev.
Leavenworth, Topeka & So. W'n Ry. (*See A.,T.& S.F.*)
Lebanon Springs R. R.
4-8½ g. 6 m. 2 lo. 6 cars.
W. C. Alstyne, *Gen. Man.* ..... Albany, N. Y.
W. H. Hawkins, *Pur. Agt.* ..... Albany, N. Y.
Geo. Tefft, *M. M.* ..... Chatham, N. Y.
Lehigh Valley R. R. 4-8½ g. 495 m. 393 l.s. 36,000 cars.
H. S. Goodwin, *Gen. Supt.* ..... Bethlehem, Pa.
W. C. Alderson, *Pur. Agt.* ..... Philadelphia, Pa.
John I. Kinsey, *M. M.* ..... Packerton, Pa.
John S. Lentz, *M. C. B.* ..... Packerton, Pa.
N. J. Div.: Jas. Donnelly, *Supt.*Perth Amboy, N. J.
Coal Rds.: J. I. Blakeslee, *Supt.*Church Road, Pa.
D. Clark, *M. M.* ..... Hazleton, Pa.
John Campbell, *M. M.* ..... Hazleton, Pa.
B. M. Div.: A. G. Brodhead, *S.* Mauch Chunk, Pa.
P. Hofecker, *M. M.* ..... Weatherly, Pa.
Wy. Div.: A. Mitchell, *S. & M. M.* Wilkesbarre, Pa.
Pa. & N. Y.; and Geneva, Ithaca & Sayre R. Rs.
Wm. Stevenson, *Gen. Supt.* ..... Sayre, Pa.
J. N. Weaver, *M. M.* ..... Sayre, Pa.
Lehigh & Hudson River Ry 4-8½ g. 63 m. 3 lo. 100 cars.
Grinnell Burt, *Gen. Man.*..... Warwick, N. Y.
N. L. Furman, *Supt.* ..... Warwick, N. Y.
John Sayre, *Pur. Agt.* ..... Warwick, N. Y.
N. L. Furman, *Supt.* ..... Warwick, N. Y.
S. Mills, *M. M.* ..... Warwick, N. Y.
Lehigh & Lackawanna and Lehigh & Susquehanna R. Rs. (*See Phil. & Read.; N. J. Cen. Div.*)
Lewis & Kennebec R. R. ..... Richmond, Me.
Ligonier Valley R. R.
4-9 g. 11 m. 3 lo. 22 cars.
Thos. A. Nellon, *Gen. Manager*... Pittsburg, Pa.
Geo. Senft, *Supt. & P. Agt.* ..... Latrobe, Pa.
Little Miami R. R. (*See Penna. Co.'s Rds.*:(8) *Div.*)
Little Rock & Ft. Smith Ry.
4-8½ g. 170 m. 12 lo. 280 cars.
H. Wood, *Gen. Man.* ..... Little Rock, Ark.
F. A. Slater, *Gen. Supt.* ..... Little Rock Ark.
F. Hufsmith, *M. M. & C. B.*..Arkansas City, Ark.
Little Rock & Fort Smith R. R. 4-8½ g. 170 m. 6 lo. 150 cars.
Hy. Wood, *Gen. Man.* ..... Little Rock, Ark.
F. A. Slater, *Gen. Supt.* ..... Little Rock, Ark.
F. Hufsmith, *M. M. & M. C. B.*..... Argenta, Ark.
Little Saw Mill Run R. R. 3 & 4-8½ g. 8 m. 4 lo. 327 c.
T. Hartley, *Gen. Man.* ..... Pittsburg, Pa.
Long Island R. R. 4-8½ g. 352 m. 92 l.s. 953 cars.
I. D. Barton, *Gen. Supt.*, Long Island City, N. Y.
Benj. Norton, *Pur. Agt.* Long Island City, N. Y.
C. A. Thompson, *M. M.* Long Island City, N. Y.
Longview & Sabine Valley R. R. 4-8½ g. 17 m. 1 lo. 2 cars.
Louisiana W'n R. R. (*See Cin., Pac.; G., H. & S. A. Div.*)
Louisville & Lexington Ry. 4-8½ g. 84 m. 2 l.s. 1,000 cars.
Louis. Evans. & St. L. Ry. 4-8½ g. 254 m. 24 lo. 1,032 c.
Geo. T. Evans, *Gen. Man* ..... Louisville, Ky.
W. H. Field, *Pur. Agt.* ..... Louisville, Ky.
F. P. Bostman, *M. M.* ..... Evansville, Ind.
Louisville, New Albany & Chicago Ry.
4-8½ g. 470 miles 56 lo. 3,700 cars.
John MacLeod, *Gen. Supt.* ..... Louisville, Ky.
H. O. Course, *Pur. Agt.* ..... Louisville, Ky.
Josiah Bettis, *M. M. & C. B.*.....New Albany, Ind.
C. C. P. Bent, *Supt. Car Dep.*..... Louisville, Ky.
Louisville, New Orleans & Tex. Ry. 450 m. In progress.
R. T. Wilson, *Dir.*; 2 Exchange Ct., New York.
Louisville & Nashville R. R.
5 g. 2,186 m. 380 lo. 12,197 cars.
B. Dunbaugh, *Gen. Man.* ..... Louisville, Ky.
J. T. Harahan, *Gen. Supt.* ..... Louisville, Ky.
W. P. Harris, *Supt.* ..... Louisville, Ky.
P. P. Hudson, *Pur. Agt.* ..... Louisville, Ky.
Reuben Wells, *Supt. Mach.* ..... Louisville, Ky.
Louis. Cin. & Lex. Div.:
J. G. Metcalf, *Supt. Trans.* ..... Louisville, Ky.
P. Leeds, *M. M.* ..... Louisville, Ky.
J. W. Luttrell, *M. M.* ..... Louisville, Ky.
J. G. Clifford, *M. M.*53 & C. Div.; Bowling Grn. Ky.
Henderson Div.: Hege, *Supt.* ..... Henderson, Ky.
W. F. Pike, *M. M.* ..... Nashville, Tenn.
Nash. & D. Div.: J. Geddes, *Supt.*Nashville, Tenn.
S. & A. Div.: E. Marsh, *M. M.* ..... Nashville, Tenn.
G. W. White, *M. M.* ..... Birmingham, Ala.
Mob. & A. W. Div. Penns. & Sel.: S. B. Reed, *Supt.*
M. S. Belknap, *Supt.* ..... Montgomery, Ala.
J. S. Hall, *M.M.*Mont. Shops; Montgomery, Ala.
N. O. Div.: O. M. Dunn, *Supt.* ..... New Orleans, La.
Wm. Adair, *M. M.* ..... Mobile, Ala.
Memp. Div.: W. Lincamp, *Supt.* Memphis, Tenn.
J. V. Slusser, *M. M.* ..... Memphis, Tenn.
St. L. Div.: C. O. Parker, *Supt.* Mo. tonnery, Ala.
Thos. Walsh, *M. M.* ..... Decatur, Ala.
Louisville & Wadley R. R. 5 g. 10 m. 1 lo. 5 c.
J. H. Wilkins, *Supt. & Pur. Agt.* Louisville, Ky.

M

Macon & Brunswick R. R.
(*See Texas, Vic. & Ga.; At. & Ga. Divs.*)
Maine Central R. R. 4-8½ g. 465 m. 59 lo. 1,333 c.
Payson Tucker, *Gen. Man.* ..... Portland, Me.
Ira K. Russell, *M. M.* ..... Augusta, Me.
C. H. Kenison, *M. C. B.* ..... Augusta, Me.
Eastern Maine. 3 g. 31 m. 1 lo. 2 c.
L. L. Lincoln, *Supt.* ..... Portland, Me.
Manchester & Keene R. R. 4-8½ g. 30 m. (*See Concord.*)
Manchester & Lawrence R. R.
Manchester & North Weare R. R. (*See Concord.*)
Manhattan Ry. 4-8½ g. 228 m. 2 lo. 2 cars.
Frank K. Hain, *Gen. Man.* ..... New York, N. Y.
W. T. Scandale, *Supt. Trans.* ..... New York, N. Y.
T. W. Peeples, *M. M.* ..... New York, N. Y.
H. A. Webster, *M. C. B.* ..... New York, N. Y.
Manhattan, Lima & Burlington R. R. (*See A.,T.& S. F.*)
Manitoba Southwestern Colonization Ry.
4-8½ g. 57 m. 3 lo. 125 cars.
J. M. Eagan, *Gen. Supt.* ..... Winnipeg, Man.
Chas. Newell, *M. M.* ..... Winnipeg, Man.
Marietta & Cincinnati R. R. (*See Cin. Wn. & Balt.*)
Marietta & North Georgia R. R. 3 g. 60 m. 3 lo. 7 c.
J. H. Glover, *Supt. & P. Agt.* ..... Marietta, Ga.
E. A. Withers, *M. M.* ..... Marietta, Ga.
Marquette, Houghton & Ontonagon R. R.
4-8½ g. 100 m. 43 lo. 2,530 cars.
Samuel Schoch, *Gen. Man.* ..... Marquette, Mich.
M. B. McGee, *Pur. Agt.* ..... Marquette, Mich.
W. A. Thompson, *M. M.* ..... Marquette, Mich.
H. D. Lyons, *M. C. B.* ..... Marquette, Mich.
aryland Central R. R. 3 g. 77 m. 4 lo. 50 cars.
S. G. Boyd, *Supt.* ..... Baltimore, Md.
Massachusetts Central R. R. 4-8½ g. 48 m. 5 l. 81 c.
E. G. Allen, *Supt. & Pur. Agt.* ..... Boston, Mass.
E. A. Walker, *M. M.* ..... So. Sudbury, Mass.
McComb, Deshler & Toledo R. R.
(*See Cin., Ham. & Day.; D. & M. Div.*)

Meadville Ry. (*See Penna. Co.'s Rds.*:(2) *Div.*)
Memphis & Charleston R. R. (*See E. Tenn. Va. & Ga.*)
Memphis & Lit. Rock R. R. 4 g. 135 m. 14 lo. 200 c.
R. Fink, *G. Man. & P. A.*..... Little Rock, Ark.
H. G. Fleming, *Supt.* ..... Memphis, Tenn.
Thos. Rennell, *M. M.* ..... Argenta, Ark.
T. Rennell, *M. C. B.* ..... Argenta, Ark.
Mexican Ry. 4-8½ g. 263 m. 16 lo. 610 cars.
E. W. Jackson, *Gen. Man.* ..... Mexico, Mex.
Mexican Central Ry. 4-8½ g. 680 m. 73 lo. 60 cars.
Theo. Nickerson, *Pur. Agt.* ..... Boston, Mass.
D. B. Robinson, *Gen. Man.*..... City of Mexico.
D. Mackenzie, *Gen. Supt.* ..... City of Mexico.
G. T. Jarvis, *Div. Supt.*..... City of Mexico.
J. H. Smith, *Div. Supt.* ..... Jimulco, Mex.
Wm. Davis, *Div. Supt.* ..... Jimulco, Mex.
E. E. Comfort, *Div. Supt.*Paso Del Norte, Mex.
4th Div.: E. E. Comfort, *Supt.*Paso Del Norte, Mex.
Mexican National Ry. 3 g. 766 m. 50 lo. 1,283 c.
Texas Mexican Ry. 3 g. 171 m. 10 lo. 200 c.
R. C. Peebles, *Supt.* ..... Mexico, Mex.
W. F. Baldwin, *Gen. Supt.* ..... Laredo, Tex.
Gulf Div.: J. M. Ryle, *Supt.*; M. Quin, *Supt.* Galveston, Tex.
No. Div. Mex. Nat. Ry. & So. Div. Tex.-Mex. Ry.
C. A. Merriam, *Supt.* ..... Laredo, Texas.
Jno. Harding, *M. & C. B.* Corpus Christi, Tex.
So. Div. M. & N. W. Ry.: W. E. Lewis, *Supt.* Mexico, Mex.
J. B. Winslow, *M. M.* ..... Mexico, Mex.
Mat. Div.: F. E. Butterfield, *Supt.* Matamoras, Mex
Mexican Central Ry. Inter-Oceanic & International R. R. 1,400 miles. In progress.
J. M. Dodge, *Pres.* 1907 N. New York Ave., Washington, D. C.
Michigan Cen. R. R. 4-8½ g. 1,485 m. 357 lo. 11,284 c.
H. B. Ledyard, *Pres.&Gen. Man.*Detroit, Mich.
E. C. Brown, *Gen. Supt* ..... Detroit, Mich.
Robert Miller, *Asst. Gen. Supt.*..Detroit, Mich.
Allan Bourn, *Pur. Agt.* ..... Detroit, Mich.
S. P. Edgerly, *Gen. M. M.* ..... Jackson, Mich.
(1) Lines West of Detroit River:
E. D. Kiley, *Gen. Supt.* ..... Detroit, Mich.
East. Div.: D. S. Sutherland, *Supt.*Detroit, Mich.
Bay City, Saginaw & Mackinaw Divs.:
W. A. Vaughan, *Supt.* ..... Bay City, Mich.
C. E. Smart, *M. M.* ..... Bay City, Mich.
Main Line: Gr. Rap.; So. Bend; and Sag. Val. Divs.:
C. B. Bush, *Supt.* ..... Jackson, Mich.
W'n Divs.: R. H. Hammediest, *Supt.*Chicago, Ill.
(2) Lines East of Detroit River:
Wm. H. Perry, *Agt.* ..... Buffalo, N. Y.
J. E. Brown, *Supt.* ..... St. Thomas, Ont.
A. Bull, *M. M.* ..... St. Thomas, Ont.
Rob't Potts, *M. C. B.*..... St. Thomas, Ont.

Michigan & Ohio:
Luther Allen, *Supt.* ..... Toledo, O.
H. H. Mitchell, *Pur. Agt.* ..... Toledo, O.
D. J. Durrell, *M. M.* ..... Marshall, Mich.
Middleburgh & Schoharie:
Schoharie Valley R. Rs. 4-8½ g. 11 m. 2 lo. 6 cars.
P. S. Danforth, *Gen. Supt.* ..... Middleburg, N. Y.
Midland of Canada. (*See Can. Southern.*)
Midland No. Carolina Ry. 5 g. 95 m. 9 lo. 82 cars.
Atlantic & North Carolina Ry. ..... 22 m.
John D. Whitford, *Gen. Man.*..Newbern, N. C.
J. A. Bryan, *Supt.* ..... Newbern, N. C
D. J. Sprague, *Pur. Agt.* ..... New York, N. Y.
B. Manly, *Supt. of Mach.*..... Newbern, N. C.
Milwaukee, Lake Shore & Western Ry.
4-8½ g. 370 m. 45 lo. 5,000 cars.
H. G. H. Reed, *Gen. Man. & P. Agt.*Milwaukee, Wis.
J. Donahue, *Supt.* ..... Milwaukee, Wis.
David B. Curtis, *Asst. Supt.*..... Oshkosh, Wis.
John Hickey, *M. M.* ..... Ledyard, Wis.
Milwaukee & Northern and Wisconsin Central Ry.
R. Rds. 4-8½ g. 228 m. 241 t. 703 cars.
C. F. Dutton, *Gen. Supt.* ..... Milwaukee, Wis.
S. Kimball, *M. M.* ..... Ft. Howard, Wis.
Mineral Range R. R. 3 g. 13 m. 4 lo. 43 cars.
Chas. D. Holland, *Pr. & Supt.*..Hancock, Mich.
W. H. Carr, *Pur. Agt.* ..... Hancock, Mich.
T. J. Shelhorn, *M. M. & C. B.*.Hancock, Mich.
Minneapolis, Lyndale & Minnetonka Ry.
3 g. 20 miles 4 motors 1 lo. 35 cars.
Willis McNeely, *Gen. Man.* ..... Minneapolis, Minn.
T. W. Heintzelman, *M. M.* ..Minneapolis, Minn.
Mississippi, Terre Aux Boeufs & Lake R. R.
7 miles.
M. R. Scelman, *Supt.* ..... New Orleans, La.
Mississippi & Tenn. R. R. 4-8½ g. 101 m. 12 lo. 194 c.
M. Burns, *Gen. Supt.* ..... Memphis, Tenn.
J. C. Ramsey, *M. M.* ..... Memphis, Tenn.
T. J. Bolton, *M. C. B.*..... Memphis, Tenn.
Missouri, Kansas & Texas Ry. (*See Mo. Pac.*:(2) *Div.*)
Missouri Pacific Ry. (Leased and operated lines.)
4-8½ g. 0,029 m. 697 l.s. 19,745 cars.
A. A. Talmage, *4th V. Pres.* ..... St. Louis, Mo.
R. H. Lyle, *Pur. Agt.* ..... St. Louis, Mo.
(1), (2) and (3) Divs.:
John Hewitt, *Supt. M. P. & M.* ...St. Louis, Mo.
John Gardner, *Supt. Car Dep.*..... St. Louis, Mo.
(4), (5) and (6) Divs.:
O. A. Haynes, *S. M. P. & M.* ..... Marshall, Tex.
(1) Missouri Pacific Ry. 1,028 m. 155 lo. 4,218 cars.
A. M. Hager, *Supt.* ..... Sedalia, Mo.
E. Taylor, *M. M.* ..... Sedalia, Mo.
W'n Div.: W. W. Fagan, *Supt.* .....Atchison, Kan.
(2) Mo., Kan. & Tex. Ry. 1,308 m. 140 lo. 4,248 cars.
S. Irvin, *Asst. Supt. Car Dep.*..... Parsons, Kan.
J. B. Vandyne, *Supt.* ..... Parsons, Kan.
J. W. Hamilton, *M. M.* ..... Parsons, Kan.
(3) Central Branch Un. Pac. R. R. 388 m. 30 lo. 599 c.
W. W. Fagan, *Supt.* ..... Atchison, Kan.
H. V. Farlee, *M. M.* ..... Atchison, Kan.
J. W. Blackburn, *A. Supt. Car D.* Atchison, Kan.
(4) St. L., I. M. & So'n Ry. 905 m. 16 lo. 1,928 c.
Wm. Kerrigan, *Supt.* ..... St. Louis, Mo.
St. Louis Div.: Jno. Harris, *M. M.* De Soto, Mo.
Ark. Div.: J. J. Frey, *Supt.* ..... Little Rock, Ark.
R. M. Richardson, *M. M.* ..... Little Rock, Ark.
(5) Int. & N. Ry. 256 m. 10 lo. 500 cars. *Supt.* Palestine, Tex.
W. S. Morris, *M. M.* ..... Palestine, Tex.
(6) Tex. & Pac. ..... W. Cummings, *Supt.* Marshall, Tex.
E. N. Gould, *Tr. Com. Divs.*
Geo. Dimick, *Supt.* ..... Marshall, Tex.
E. A. Haggerty, *M. M.* ..... Marshall, Tex.
E. R. Smith, *M. M. & M. C. B.* N. Orleans, La.
Rio Grande Div.:
B. Flannigan, *Supt.* ..... Big Springs, Tex.
E. A. Salisbury, *M. M.* ..... Big Springs, Tex.
Mobile & Ala. Grand Trunk R. R. 5 g. 306 m. 36 lo. 96 c.
Wm. H. Pratt, *Trustee* ..... Mobile, Ala.
Mobile & Girard R. R. 5 g. 84 m. 2 lo. 12 cars.
W. L. Clark, *Gen. Supt.* ..... Columbus, Ga.
J. C. Albrecht, *M. M.* ..... Columbus, Ga.
J. J. Nix, *M. C. B.*..... Columbus, Ga.
Mobile & Montgomery Ry. (*See Louis. & Nash.*)
Mobile & Ohio R. R. 3 g. 471 m. 60 lo. 2,000 c.
Thomas T. A. Lyon, *Pres.* ..... Glendale, Miss.
Mobile & Ohio R. R. 5 g. 558 m. 75 lo. 1,353 cars.
G. Jonas, *Vice Pr. & Gen. Man.* ..... Mobile, Ala.
F. Jordan, *Pur. Agt.* ..... Meadville, Pa.
M. T. Carson, *Gen. M. M.* ..... Whistler, Ala.
J. T. Boots, *M. C. B.*..... Whistler, Ala.
So'n Div.: J. G. Motley, *Supt.* ..... Mobile, Ala.
L. J. Morris, *M. M.* ..... Macon, Miss.
No'n Div.: E. S. Hosford, *Supt.*..Jackson, Tenn.
H. C. Goode, *M. M.* ..... Jackson, Tenn.
Mobile & Spring Hill R. R. 5-2 g. 8 m. 1 lo. 2 cars.
F. Ingate, *Manager* ..... Mobile, Ala.
Moline & Southeastern R. R. 3-6 g. 8 m. 1 lo. 20 c.
R. Battersly, *Gen. Man.* ..... Coal Valley, Ill.
Mont Alto R. R. 4-6 g. 31 m. 2 lo. 8 cars.
G. B. Westling, *Supt. & P. A.* ..... Mont Alto, Pa.
Montgomery & Eufaula Ry. (*See Cen. of Ga.*)
Montgomery Southern Ry. 3 g. 20 m. 1 lo. 15 cars.
S. D. Hubbard, *Jr., Gen. Man.*Montgomery, Ala.
Montour R. R. 4-8½ g. 12 m. 2 lo. 130 cars.
C. R. Brown, *Supt. & Pur. Agt.* ..Imperial, Pa.
Henry Newman, *M. C. B.*..... Imperial, Pa.

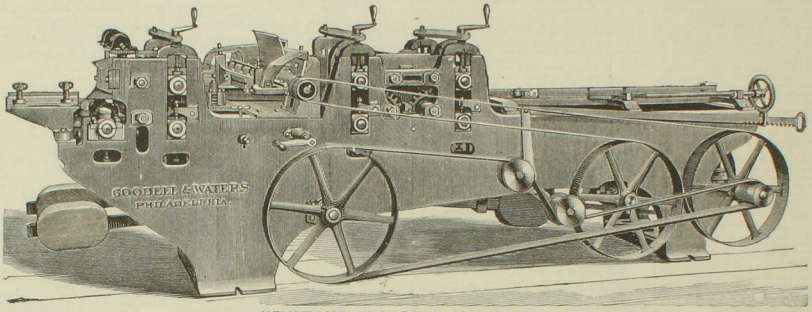
Montpelier & Wells Riv. R. R. 4-8½ g. 38 m. 3 lo. 86c.
W. A. Stowell, *Supt.* ..... Montpelier, Vt.
Montreal, Portland & Boston Ry. (*See Passumpsic.*)
Montreal & Sorel Ry. 4-8½ g. 47 m. 3 lo. 35 c.
C. Armstrong, *G. M. & Pur. Agt.*Sorel, Que.
J. F. Armstrong, *Gen. Supt.* ..... Sorel, Que.
C. W. Langborn, *M. M.* ..... Sorel, Que.
Montrose Ry. 3 g. 28 m. 3 lo. 24 cars.
T. G. Walter, *Gen. Supt.* ..... Tunkhannock, Pa.
Morgan's Louis. & Tex. R. R. 4-8½ g. 422 m. 401 l. 3,59 c.
J. Kruttschnitt, *Supt.* ..... New Orleans, La.
G. Trumpy, *Pur. Agt.* ..... New Orleans, La.
J. D. Connell, *M. M.* ..... Algiers, La.
Jno. Hildebrand, *M. C. B.*..... Algiers, La.
Mount Washington R. R. 5-3 g. 3 m. 6 lo. 0 cars.
Walter Aiken, *Gen. Man.* ..... Franklin, N. H.
Muney Creek Ry. (*See Wmspt. & No. Br.*)

N

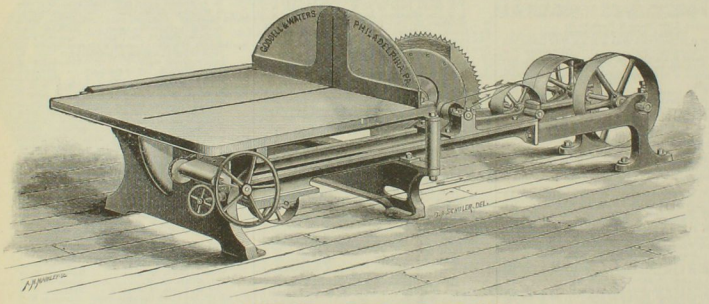
Nantasket Beach R. R. 4-8½ g. 6 m. 5 lo. 25 c.
George L. Keyes, *Gen. Supt.* ..... Boston, Mass.
Naugatuck R. R. 3 g. 4 m. 17 lo. 547 cars.
Geo. W. Beach, *Supt* ..... Waterbury, Conn.
H. A. Bishop, *Pur. Agt.* ..... Bridgeport, Conn.
Ely D. Beach, *Supt. M. P.* ..... Bridgeport, Conn.
Napanee, Tamworth & Quebec Ry. In progress.
Ed. W. Rathbun, *Man. Dir.*..Deseronto, Ont.
Nashua & Rochester R. R. (*See Concord.*) Out.
Narragansett Pier R. R. 4-8½ g. 8 m. 2 lo. 11 c.
G. N. Lamphear, *Supt. & Pur. Agt.*Wickford, R. I.
Nashua & Rochester R. R. (*See Wor. & Nash.*)
Nashville, Chattanooga & St. Louis Ry.
5 g. 530 M. Ry.; M. Quin, *Supt.* Nashville, Tenn.
J. W. Thomas, *G. Man. & P. Agt.*Nashville, Tenn.
M. J. Haas, *Gen. Supt.* ..... Nashville, Tenn.
James Cullen, *M. M. & C. B.*..Nashville, Tenn.
Nashville & Florence R. R. 5 g. 20 m.
J. T. Brown, *Supt.* ..... Columbia, Tenn.
Natchez, Jackson & Col. R. R. 3-6 g. 100 m. 7 lo. 92 c.
E. D. Frost, *Gen. Supt.* ..... Natchez, Miss.
National Car Company. 4,000 freight cars.
L. Millis, *Pres.* ..... Boston, Mass.
F. Stewart Stranahan, *Sec. & Tr.*Glen Falls, N. Y.
John B. Fletcher, *Supt.* ..... St. Albans, Vt.
Nebraska, Black Hills & Memphis R. R. 4-8½ g. 16 m.
H. M. Clarke, *Gen. Man.* ..... Girard, Kan.
C. H. Malin, *Gen. Supt.* ..... Girard, Kan.
Nevada Central Ry. (*See Union Pac.*:(7) *Div.*)
Nevada County N. G. R. R. 3 g. 23 m. 3 lo. 46 cars.
John P. Kidder, *Jr., Gen. Supt.* ..... Nevada City, Cal.
Jas. McCormick, *M. M. & C. B.*Grass Valley, Cal.
Nevada & Oregon R. R. 3 g. 30 m. 25 cars.
D. V. Balch, *M. M.* ..... Reno, Nev.
New Brunswick Ry. 4-8½ g. 419 m. 30 lo. 357 cars.
E. R. Parsons, *Gen. Supt.* ..... Woodstock, N. B.
Jesse Mathews, *M. M.* ..... Gibson, N. B.
T. N. Burpee, *M. C. B.*..... Gibson, N. B.
J. J. Scott, *Gen. Supt.* ..... Memphis, Tenn.
Thos. Armstrong, *M. M.*..... St. Andrew's, N. B.
G. H. Burpee, *M. M.* ..... St. Andrew's, N. B.
New Brunswick & Can. Ry. (*See New Brun.*)
New Castle R. R. 3-6 g. 5 m. 2 lo. 76 cars.
Geo. Pearson, *Gen. Man.* ..... New Castle, Pa.
New Castle & Beaver Valley R. R. (*See Penna. Co.*)
New Haven & Northampton R. R. 4-8½ g. 70 c.
E. S. Quintard, *Supt.* ..... New Haven, Conn.
J. M. Whitlock, *M. M. & C. B.*New Haven, Conn.
New Haven & New London R. R. 4-8½ g. 179 m. 17 lo. 608 c.
S. B. Opdyke, *Jr., Supt.* ..... New Haven, Ct.
H. G. Curtis, *Pur. Agt.* ..... New Haven, Ct.
Henry Fox, *M. M.* ..... New Haven, Ct.
John Sweeny, *For Car. Shps.*..New Haven, Ct.
New Jersey & New York Ry. 4-8½ g. 21 m. 1 lo. 40 c.
J. D. Hasbrouck, *Gen. Man* ..... Jersey City, N. J.
J. Bogart, *Supt.* ..... Hillsdale, N. Y.
L. B. Van Wagonen, *M. M. C. B.*.....Hillsdale, N. J.
N. J. Southern Ry. (*See Phil. & Read.; N. J. So. Div.*)
New London Northern R. R. (*See Central New Eng.*)
New Orleans Pacific Ry. (*See Mo. Pac.*; (6) *Div.*)
New Orleans & Carrollton R. R.
4-8½ g. 15 m. 12 lo. 79 cars.
C. V. Hulle, *Supt.* ..... New Orleans, La.
John Dahmer, *M. M.* ..... New Orleans, La.
Jas. Thorn, *M. C. B.*..... New Orleans, La.
New Orleans & Northeastern R. R. (*See St. Louis & Cairo.*)
N. O. & Northeastern R. R. (*See Cin., N. O. & Tex. Pac.*)
New Orleans & Selma R. R. 5 g. 21 m. 1 lo. 8 cars.
L. J. Bonnabel, *Supt.* ..... Bonnabel, Ala.
N. Y. Central & Hudson River R.R.
4-8½ g. 1,000 m. 705 lo. 35,161 cars.
J. M. Toucey, *Gen. Supt.* ..... New York, N. Y.
R. C. Moore, *Pur. Agt.* ..... New York, N. Y.
Wm. Buchanan, *Supt. M. P.*..... New York, N. Y.
L. Garey, *Supt. Car Dept.* ..... New York, N. Y.
N. Y. & Har. Div.: W. H. Bissell, *Supt.* .....
P. McQ. Gibson, *M. M.* ..... New York, N. Y.
C. E. Garey, *M. C. B.*..... Morrisania, N. Y.
Hud. Riv.: W. H. Bissell, *Supt.* ..... New York, N. Y.
Peter Smith, *M. C. B.*..... New York, N. Y.
W'n Div.: Jonas A. Forrest, *Supt.* ..... Albany, N. Y.
John Orton, *M. M.* ..... West Albany, N. Y.
L. Packard, *M. C. B.*..... West Albany, N. Y.
Mich. Div.: Burnett Burnham, *Supt.*Detroit, Mich.
S. L. White, *M. M.* ..... Syracuse, N. Y.
Amos Small, *M. C. B.*..... Buffalo, N. Y.
E. Chamberlain, *M. C. B.* ..... E. Buffalo, N. Y.
C. H. Burchard, *M. C. B.*..... E. Rochester, N. Y.
Thos. Smith, *M. C. B.*..... Elmira, N. Y.
N. Y. Chic. & St. L. Ry. 4-8½ g. 513 m. 113 lo. 4,838 c.
Lewis Williams, *Gen. Man.* ..... Cleveland, O.
Jno. Mackenzie, *Gen. Supt.* ..... Cleveland, O.
Eas'n Div.: G. H. Kimball, *Supt.*..... Cleveland, O.
E. A. Miller, *M. M.* ..... Conneaut, O.
West'n Div.: A. H. Evans, *Supt.* ..... Chicago, Ill.
Jas. Eckford, *M. M.* ..... Bellevue, O.
New York City & Northern. 4-8½ g. 54 m. 31 lo. 398 c.
Frank S. Gannon, *Gen. Supt.*High Bridge, N. Y.
Thos. Smith, *M. C. B.*..... High Bridge, N. Y.
New York, Lackawanna & W'n Ry. (*See Del., L. & W.*)
New York, Lake Erie & Western R. R.
(*See Erie & N. Y.*)
New York, New Haven & Hartford R. R.
(1) N. Y., L. E. & W. Div. 4-8½ g. 1,073 m. 576 lo. 30,553 c.
H. Thomas, *Gen. Man.* ..... New York City, N. Y.
J. A. Hardenburgh, *Pur. Agt.* New York, N. Y.
F. M. Wilder, *Supt. M. P. & M.* ..Susqueh'a, Pa.
E'n Div.: E. G. Hay, *Supt.* ..... New York, N. Y.
J. H. Vreeland, *M. M.* ..... Jersey City, N. J.
J. B. Dilworth, *M. C. B.*..... Jersey City, N. J.
Del. Div.: W. J. Murphy, *Supt.* Port Jervis, N. Y.
J. Van Vechten, *M. M. & C. B.*Pt. Jervis, N. Y.
Susq. Div.: J. Jobb, *Supt.* ..... Elmira, N. Y.
V. Blackburn, *M. M.* ..... Susquehanna, Pa.
D. B. Updegraff, *M. C. B.*..... Susquehanna, Pa.
Buf. & R. Divs.: Chas. Nellson, *Supt.*; and
G. B. Ross, *M. M.* ..... Buffalo, N. Y.
M. Winder, *M. C. B.*..... Buffalo, N. Y.
R. & S. W. Div.: C. A. Brunn, *Supt.* ..... do.
W'n Div.: W. H. Newell, *Supt.* ..... Rochester, N. Y.
Geo. H. Griggs, *M. M.* ..... Hornellsville, N. Y.
N. Y. & Greenwood L. Ry. 4-8½ g. 44 m. 8 lo. 53 c.
Stephen Smith, *Gen. Supt.* ..... New York, N. Y.
F. A. Stinard, *M. M.* ..... Pompton, N. J.
(2) N. Y., Prov. & Bos. R. R. 4-8½ g. 95 m. 2 lo. 100 cars.
J. M. Ferris, *Gen. Supt.* ..... Cleveland, Ohio.
H. J. Davis, *Pur. Agt.* ..... Cleveland, Ohio.
Wm. Buller, *Gen. M. M. & C. B.*..... Cleveland, O.
S. V. Smith, *Asst. Gen. M. M. C. B.*..... Kent, Ohio.
E'n Div.: C. Hopkins, *Supt.* ..... Meadville, Pa.
J. A. Cooper, *M. M.* ..... Meadville, Pa.
D. S. Dockstader, *M. C. Rep.* ..... Meadville, Pa.
Wm. Hill, *M. M.* ..... Galion, O.
Geo. Hodge, *For. Car Rep.* ..... Galion, O.
Geo. Wilson, *For. Car Rep.* ..... Dayton, Ohio.
Mahoning W'n Div.: W. Wood, *Supt.* ..... Cleveland, O.
N. Wright, *M. M.* ..... Cleveland, O.
C. N. Thorp, *M. C. Rep* ..... Cleveland, O.
New York, New Haven & Hartford R. R.
4-8½ g. 393 m. 123 lo. 2,768 cars.
E. M. Reed, *V. P. & Gen. Man.* New Haven, Ct.
R. N. Dowd, *Pur. Agt.* ..... New Haven, Ct.
N. Y. & N. H. Div.: W. H. Stevenson, *Supt.*..N. Y.
Shore Line and Air Line Divs.:
O. M. Shepard, *Supt.* ..... N. Haven, Ct.
H. Kettendorf, *Supt. M. P.*..... New Haven, Ct.
Jas. Denver, *M. C. B.*..... New Haven, Ct.
Hart. Div.: C. S. Davidson, *Supt.*.. Hartford, Ct.
John Henny, *Jr., Supt. M. P. & M. C. B.*.....do.
N. Y., Pittsb'h & Chicago. 4-8½ g. 20 m. 2 lo. 32 c.
Geo. W. Dixon, *Supt.* ..... Montpelier, Vt.
H. T. Hanna, *Pur. Agt* ..... Pittsburgh, Pa.
N. Y., Pennsylvania & Ohio R. R. (*See N. Y., L. E. & W.*)
New York, Philadelphia & Norfolk R. R.
4-8½ g. 10 m. 1 lo. 4 cars.
Jas. McConkey, *Supt.* ..... Princess Ann, Md.
New York, Providence & Boston R. R.
4-8½ g. 83 m. 29 lo. 430 cars.
J. B. Gardner, *Supt.* ..... Providence, R. I.
Giles F. Ward, *Pur. Agt.* ..... Stonington, Conn.
J. H. Manchester, *M. M. & C. B.*Providence, R. I.
N. Y., Susqueh'na & W'n. 4-g. 147 m. 33 lo. 1,469 c.
F. A. Potts, *Gen. Man.* ..... New York, N. Y.
C. D. McKelvey, *Asst. Supt.* ..Jersey City, N. J.
C. T. Demarest, *Pur. Agt.* ..... New York, N. Y.
Wm. Wortendyke, *M. M.* ..... Wortendyke, N. J.
New York, Texas & Mexican Ry.
4-8½ g. 97 m. 3 lo. 95 cars.
Allen McCoy, *Gen. Man.* ..... Victoria, Tex.
J. G. Conlon, *M. M.* ..... Victoria, Tex.
New York, West Shore & Buffalo.
4-8½ g. 850 m. 98 lo. 2,907 c.
J. D. Layng, *Gen. Supt.* ..... New York, N. Y.
C. D. Gorham, *Asst. Gen. Supt.*Weehawken, N. J.
P. S. Bemis, *Pur. Agt* ..... New York, N. Y.
B. H. Soule, *Gen. M. M.* ..... In progress.
H. R. Div.: C. W. Bradley, *Supt.* .....
Weehawken, N. J.
Harry Linn, *M. M.* ..... New Durham, N. J
Mah'k Div.: H. W. Gardiner, *Supt.*Syracuse, N. Y.
Buff. Div.: F. B. Merrill, *Supt.* ..... Buffalo, N. Y.
New York, Ontario & Western.
J. M. Clarke, *Gen. Man.* ..... New York, N

# Goodell & Waters

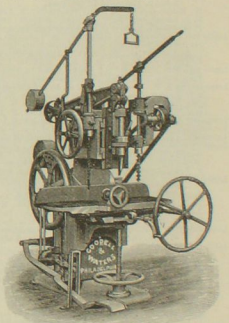
## PHILADELPHIA, PA.




KEYSTONE FLOORING MACHINE.

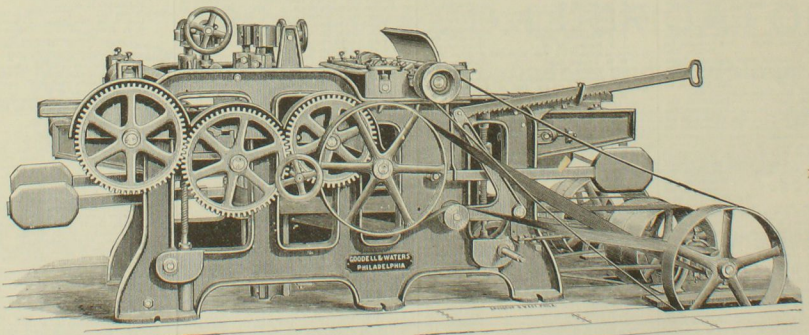



LARGE TRAVERSE CUT-OFF SAW.



HEAVY CAR MORTISER.

FOR PLANING MILLS, CAR SHOPS, BRIDGE BUILDERS, Etc., Etc.




NEW CATALOGUE IS NO READY

SEND FOR A COPY.

CAR SILL PLANER AND DOUBLE-SURFACER AND JOINTER.

## GOODELL & WATERS,

31st and Chestnut Streets, - - - - PHILADELPHIA, PA.

Owensboro & Nashville R. R. 5 gr. 44 m. 3 lo. 70 c.
M. Newbold, *Supt.* ..... Owensboro, Ky.
H. M. Gabel, *M. M. & C. B.* ..... Owensboro, Ky.
Oxford & Henderson R. R. 4-8¼ g. 13 m. 2 lo. 11 c.
James A. White, *Gen. Supt.* ..... Henderson, N. C.
James E. Lawrence, *M. M.* ..... Henderson, N. C.

P

Pacific Coast Ry. ..... 3 gr. 64 m.
J. M. Fillmore, *Manager.* San Luis Obispo, Cal.
W. H. Masterman, *M. M. & C. B.* ..... do.
Painesville & Youngstown Ry. 3 g. 95 m. 7 lo. 319 c.
R. K. Paige, *Sec. & Mas.* ..... Painesville, O.
J. A. Newcome, *Supt. & Sur.* ..... Painesville, O.
Panama R. R. ..... 4 gr. 8 m. 14 lo. 2,200 cs.
J. J. Tribe, *Supt.* ..... Aspinwall, U. S. Col.
E. Z. Penfield, *Pur. Agt.* ..... New York, N. Y.
D. Wright, *M. M.* ..... Aspinwall, U. S. Col.
Passumpsic R. R. 4-8¼ g. 147 m. 28 lo. 1,101 cars.
E. Raymond, *Pres. & Pur. Agt.* Boston, Mass.
H. E. Folsom, *Supt.* ..... Lyndonville, Vt.
L. C. Brigham, *M. M.* ..... Lyndonville, Vt.
L. F. Woodard, *M. C. B.* ..... Lyndonville, Vt.
Paulding & Cecil Railway. 4-8¼ g. 7 m. 3 lo. 0 c.
S. K. Eagle, *Pres.* ..... Cecil, O.
Paw Paw and Toledo & South Haven R. Rds.
3 gr. 20 m. 3 lo. 16 cars
John Ihling, *Supt.* ..... Lawton, Mich.
Peach Bottom R. R. 5 g. 55 m. 6 lo. 52 cars.
R. B. Newton, *Supt. & Pur. Agt.* ..... Oxford, Pa.
E. H. Williams, *M. C. B.* ..... York, Pa.
W. Kirk, *M. M.* ..... Oxford, Pa.
Pemigewasset Valley R. R. 4-8¼ g. 21 m. 2 lo. 127c.
E. Raymond, *Pres. & Pur. Agt.* Boston, Mass.
H. E. Folsom, *Supt.* ..... Lyndonville, Vt.
L. C. Brigham, *M. M.* ..... Lyndonville, Vt.
L. F. Woodard, *M. C. B.* ..... Lyndonville, Vt.
Paulding & Cecil Railway. 4-8¼ g. 7 m. 3 lo. 0 c.
S. K. Eagle, *Pres.* ..... Cecil, O.
Paw Paw and Toledo & South Haven R. Rds.
3 gr. 20 m. 3 lo. 16 cars
John Ihling, *Supt.* ..... Lawton, Mich.
Peach Bottom R. R. 5 g. 55 m. 6 lo. 52 cars.
R. B. Newton, *Supt. & Pur. Agt.* ..... Oxford, Pa.
E. H. Williams, *M. C. B.* ..... York, Pa.
W. Kirk, *M. M.* ..... Oxford, Pa.
Pemigewasset Valley R. R. 4-8¼ g. 21 m. 2 lo. 127c.
E. Raymond, *Pres. & Pur. Agt.* Boston, Mass.
Pennsylvania Co.'s (O.) Southern Div. .....
4-9 g. 3,222 m. 920 lo. 32,800 cars.
Gen. Divs. (1), (3), (4) and (5).
Wm. A. Baldwin, *Gen. Mas.* ..... Pittsburg, Pa.
John Thomas, *Gen. Supt.* ..... Pittsburg, Pa.
Wm. Mullins, *Gen. Pur. Agt.* ..... Pittsburg, Pa.
Joseph Wood, *Supt. M. P.* ..... Fort Wayne, Ind.
(1) Pittsburg, Ft. Wayne & Chicago Ry.
4-9 g. 468 m. 288 lo. 8,023 cars.
En'ds' Div.: A. B. Starr, *Supt.* ..... Allegheny, Pa.
Geo. Parkin, *M. M.* ..... Allegheny, Pa.
D. M. Peppard, *M. M.* ..... Crestline, O.
Wm. Div.: C. D. Law, *Supt.* ..... Ft. Wayne, Ind.
F. D. Casanave, *M. M.* ..... Ft. Wayne, Ind.
H. H. Somers, *Gen. Pur. Agent.* Pittsburg, Pa.
(2) Ashtabula & Pittsburg, and
(3) Erie & Pittsburg R. Rds. 221 m. 29 lo. 2,262 c.
John M. Kinhall, *Supt.* ..... Lawrence Junc., Pa.
J. A. Wood, *Gen. Pur. Shops.* ..... Erie, Pa.
(4) Cleveland & Pittsburg R. R. 225 m. 97 lo. 3,000 cs.
R. F. Smith, *Asst. Mas.* ..... Cleveland, O.
Philip Bruner, *Supt.* ..... Wellsville, O.
Benjamin Sheaff, *Asst. of Mach.* Wellsville, O.
(5) Nc-W-Nn Ohio Ry.: J. S. Morris, *Supt.* ..... Toledo, O.
Pennsylvania R. R. Co.'s Southwest System.
4-9 g. 3,158 m. 1,459 loco. 66,816 cars.
Chas. E. Puch, *Gen. Mas.* ..... Philadelphia, Pa.
Enoch Lewis, *Pur. Agt.* ..... Philadelphia, Pa.
John Reilly, *Supt. Trans.* ..... Philadelphia, Pa.
T. N. Ely, *Gen. S. & T.* ..... Altoona, Pa.
(1) Pennsylvania R. R. Divs.
4-9 g. 1,213 m. 705 lo. 40,819 cars.
S. M. Prevost, *Gen. Supt.* ..... Altoona, Pa.
Frank L. Sheppard, *Supt. M. P.* ..... Altoona, Pa.
G. W. Strahan, *M. M.* ..... Altoona, Pa.
Jno. P. Levan, *Gen. Fore.* ..... Altoona, Pa.
Phila. Div.: Tho. Gucker, *Supt.* Philadelphia, Pa.
H. D. Garrett, *M. M.* ..... Philadelphia, Pa.
I. W. Van Houten, *Gen. For.* ..... W. Phila., Pa.
Mid. Div.: O. E. McClellan, *Supt.* ..... Harrisburg, Pa.
E. L. Caum, *M. M.* ..... Harrisburg, Pa.
Samuel W. Myers, *Gen. For.* Harrisburg, Pa.
Altoona Div.: Jas. Reed, *Supt.* ..... Altoona, Pa.
Pitts. Div.: Robert Pitcairn, *Supt.* ..... Pittsburg, Pa.
D. O. Shaver, *M. M.* ..... Pittsburg, Pa.
J. G. Stewart, *Gen. For.* ..... Pittsburg, Pa.
W. Pa. Div.: A. P. Kirtland, *Supt.* Blairsville, Pa.
W. H. Norris, *M. M.* ..... Blairsville, Pa.
M. H. Fails, *Gen. For.* ..... Blairsville, Pa.
Fred. Div.: J. H. Hutchinson, *Supt.* ..... Tyrone, Pa.
Tyrone Div.: S. S. Blair, *Supt.* ..... Tyrone, Pa.
Lew. Div.: Wm. M. Phillips, *Supt.* Lewistown, Pa.
Bed. Div.: R. L. Hollidaysburg ..... Bedford, Pa.
Monong. Div.: David M. Watt, *Supt.* Pittsburg, Pa.
Wm. Lininger, *M. M.* ..... Pittsburg, Pa.
(2) United R. Rs. of N. J. Divs. 471 m. 330 lo. 4,041 c.
F. Wolcott Jackson, *Gen. Sup.* Jersey City, N. J.
H. S. Hayward, *Supt. M. P.* ..... Jersey City, N. J.
David H. Baker, *Gen. For.* ..... Jersey City, N. J.
N. Y. Div.: Robt. E. Pattison, *Supt.* ..... Jersey City, N. J.
L. A. Bosdevex, *M. M.* ..... Jersey City, N. J.
F. D. Bosdevex, *Gen. For.* ..... Jersey City, N. J.
Bely. Div.: J. A. Anderson, *Supt.* ..... Lambertv'e, N. J.
E. McDovell, *M. M.* ..... Lambertville, N. J.
Amboy Div.: I. S. Buckelew, *Supt.* ..... Jamesburg, N. J.
Thos. Kerr, *M. M.* ..... So. Amboy, N. J.
P. S. Bozart, *Gen. For.* ..... So. Amboy, N. J.
(2a) Camden & At. Rd. ..... 75 m. 18 v. 261 c.
W. N. Barnard, *Supt.* ..... Camden, N. J.
Rafus Hill, *M. M.* ..... Camden, N. J.
Samuel Wills, *M. C. B.* ..... Camden, N. J.
(3) West Jersey R. R. 4-8¼ g. 188 m. 27 lo. 1,000 cs.
Joseph Crawford, *Gen. Supt.* ..... Camden, N. J.
W. McAlister, *M. M.* ..... Camden, N. J.
C. C. Williams, *Gen. For.* ..... Camden, N. J.
(4) Phila. Wilm. & Balt. R.R. 409 m. 128 lo. 1,882 c.
H. F. Kenney, *Gen. Supt.* ..... Philadelphia, Pa.
J. M. Wills, *M. M.* ..... Philadelphia, Pa.
H. D. Gordon, *M. M.* ..... Wilmington, Del.
W. D. Langren, *M. C. B.* ..... Wilmington, Del.
Cen. Div.: L. K. Lodge, *Supt.* ..... Media, Pa.
Del. Div.: I. N. Mills, *Supt.* ..... Wilmington, Del.
Md. Div.: H. H. Carter, *Supt.* Wilmington, Del.
(5) Phila. & Erie R. R. Divs.: 437 m. 119 lo. 3,089 c.
R. Nelson, *Gen. Supt.* ..... Philadelphia, Pa.
A. O. Dayton, *Supt. Mo. Fo.* Williamsport, Pa.
Erie Div.: E. P. Westfall, *Supt.* Williamsport, Pa.
Wm. H. & W. Div.: A. Walter, *Supt.*; and
H. K. Stout, *M. M.* ..... Sunbury, Pa.
Mid. Div.: Tho. A. Roberts, *Supt.* ..... Sunbury, Pa.
Wm. L. Holman, *M. M.* ..... Renovo, Pa.
West'n Div.: J. W. Reynolds, *Supt.* ..... Erie, Pa.
W. T. Smith, *M. M.* ..... Erie, Pa.
(6) Northern Central Ry. 4-9 g. 346 m. 152 lo. 6,010 c.
Robert Nelson, *Gen. Supt.* Williamsport, Pa.
A. O. Dayton, *Supt. M. P.* ..... Williamsport, Pa.
A. W. Sumner, *Pur. Agt.* ..... Baltimore, Md.
J. M. Coale, *M. M.* ..... Baltimore, Md.
G. W. Demarest, *Gen. For.* ..... Baltimore, Md.
Susq. Div.: E. B. Westfall, *Supt.* ..... Williamsport, Pa.
Shan. Div.: A. Walter, *Supt.* ..... Sunbury, Pa.
Elm. or Tan. Divs.: S. Meade, *Supt.* ..... Elmira, N. Y.
Jas. Strode, *M. M.* ..... Elmira, N. Y.
J. C. Dyott, *Gen. For.* ..... Elmira, N. Y.
Baltimore Div.: H. W. Rapp, *Supt.* ..... Baltimore, Md.
(7) Balt. & Pot. & Alex. & Fred. 125 m. 30 lo. 500 c.
H. F. Kenny, *Gen. Supt.* ..... Philadelphia, Pa.
A. W. Sumner, *Pur. Agt.* ..... Baltimore, Md.
J. M. Wallis, *Supt. Mo. Po.* ..... Philadelphia, Pa.
H. D. Gordon, *M. M.* ..... Wilmington, Del.
J. Lescallett, *For. Mach. Shop* Washington, D. C.
H. F. Downs, *For. Car Shops* ..... Washington, D. C.
Penn. Coal Co.'s R. R. 4-3 g. 67 m. 23 eng. 3,271 c.
J. B. South, *Gen. Supt.* ..... Dunmore, Pa.
And. Crane, *M. M.* ..... Dunmore, Pa.
Geo. W. Simpson, *M. C. B.* ..... Dunmore, Pa.
Pennsylvania, Shamokin & Mt. Carmel R. R.
In progress. 4-8½ g. 18 m. 1 lo. 20 cars.
C. H. Stanton, *Supt.* ..... New York, N. Y.
Pennsylvania & Erie R. R.—Early Branch.
C. R. Early, *Gen. Supt.* ..... Ridgeway, Pa.
Pensacola & Atlantic R. R. 4-9 g. 101 m. 10 lo. 67 cars.
W. D. Chipley, *Gen. Supt.* ..... Pensacola, Fla.
W. D. Roby, *M. M.* ..... Pensacola, Fla.
Pensacola & Perdido R. R. 5 g. 10 m. 3 lo. 6 cars.
B. F. Simmons, *Pr. & Supt.* ..... Pensacola, Fla.
H. W. Simmons, *Gen. Sup.* ..... Pensacola, Fla.
J. C. Schutte, *M. M.* ..... Pensacola, Fla.
People's Ry. 4-8½ g. 15 m. 0 lo. 14 cars.
W. D. Pollard, *Supt.* ..... Pottsville, Pa.
Peoria, Decatur & Evansville Ry.
4-8½ g. 554 m. 30 lo. 1,660 cars.
G. L. Bradbury, *Gen. Man.* ..... Peoria, Ill
P. Reilly, *M. M.* ..... Mattoon, Ill.
Peoria & Farmington R. R. ..... (See *Cen. Ia.*)
Peoria & Pekin Union Ry. 4-8½ g. 20 m. 12 lo. 106 c.
Thos. B. Burnett, *Gen. Supt. & P. Agent.* Peoria, Ill.
R. F. Hurd, *M. M. & C. B.* ..... Peoria, Ill.
Perkiomen R. R. 4-8½ gauge 30 miles.
D. B. Clack, *Supt.* ..... Perkiomen Junction, Pa.
H. Boyd, *Pur. Agt.* ..... Norristown, Pa.
Petersburg R. R. 4-8½ g. 64 m. 10 lo. 133 cars.
R. M. Sully, *Gen. Supt.* ..... Petersburg, Va.
Geo. F. Jones, *Pur. Agt.* ..... Petersburg, Va.
R. R. Andrews, *M. M.* ..... Petersburg, Va.
J. W. Fleming, *M. C. B.* ..... Petersburg, Va.
Phila., Wilmington & Balt. R. R. (*See Penna. R. R.*)
Peterborough & Hillsborough. (*See Northern, N. H.*)
Philadelphia, Newtown & New York R. R.
4-8½ g. 23 m.
W. M. Geary, *Supt.* ..... Philadelphia, Pa.
Phila. & Atlantic City Ry. 3-6 g. 55 m. 1 lo. 10 cars.
F. E. Wing, *Supt.* ..... Philadelphia, Pa.
W. S. Wilson, *Pur. Agt.* ..... Philadelphia, Pa.
H. M. Messiner, *M. M.* ..... Camden, N. J.
E. Lippincott, *M. C. B.* ..... Camden, N. J.
Philadelphia & Erie R. R. (*See Penna. R. R.*) (5) Div.)
Philadelphia & Reading R. R. and Branches.
4-8½ g. 1,382 m. 907 lo. 56,775 cars.
John B. Linderman, *Gen. Mas.* Philadelphia, Pa.
W. S. Wilson, *Pur. Agt.* ..... Philadelphia, Pa.
Geo. Fltz, *Supt. Trans.* ..... Reading, Pa.
L. B. Farr, *Supt. of Mach.* ..... Reading, Pa.
No. Pa. & Bound Brook Div.:
I. A. Sweigard, *Supt.* ..... Philadelphia, Pa.
Mahanoy & Shamokin and other Brs.:
J. H. Olhausen, *Supt.* ..... Pottsville, Pa.
D. C. Reinhart, *Asst. Supt.* ..... Catawissa, Pa.
A. A. Hesser, *Asst. Supt* Mahanoy Plane, Pa.
Schuylkill & Susquehanna Br.:
H. H. Tracy, *Supt.* ..... Pine Grove, Pa.
Reading & Columbia Br.:
A. H. Wilson, *Supt.* ..... Columbia, Pa.
(2) N. J. Central Div.:
W. W. Stearns, *Supt.* ..... Elizabeth, N. J.
W. Woodcock, *M. M.* ..... Elizabethport, N. J.
Geo. Hackett, *Sup. C. B.* ..... Elizabethport, N. J.
C. G. Williams, *M. M.* ..... Jersey City, N. J.
John Alpaugh, *M. M.* ..... Phillipsburg, N. J.
L. Bellis, *M. M. Lehigh Valley Supt.* Manch. N. J.
N. J. So. Div.: R. Blodgett, *Supt* ..... Manchester, N. J.
Wm. Montgomery, *M. M.* ..... Manchester, N. J.
Chas. S. Sawyer, *M. C. B.* ..... Manchester, N. J.
Lehigh & Susquehanna Div.:
W. S. Polhemus, *Supt.* ..... Mauch Chunk, Pa.
Pittsburg, Bradford & Buffalo Ry. (*See Pitts. & West.*)
Pittsburg, Chartiers & Youghiogheny R. R.
4-8½ g. 19 m.
Geo. S. Griscom, *Gen. Man.* ..... Pittsburg, Pa.
Pittsburgh, Cincinnati & St. Louis Ry. (5 Gen. Divs.)
4-9 g. 406 m. 230 lo. 7,133 cars.
James McCrea, *Manager* ..... Columbus, O.
Wm. Mullins, *Pur. Agt.* ..... Pittsburg, Pa.
Edward B. Wall, *Supt M. P.* ..... Columbus, O.
(1) P. C. & St. L. Div.: E. B. Taylor, *Supt.* Fort Wayne, Ind.
C. B. Street, *M. M.* ..... Dennison, O.
Wm. Mitchell, *Gen. For. Shops* Allegheny, Pa.
(2) C. & M. V. Div.: W. F. Black *Supt.* ..... Zanesville, O.
Leroy Kells, *M. M.* ..... Lancaster, O.
Wm. Mitchell, *Gen. For. Shops* Allegheny, Pa.
Daniel Jewell, *Gen. F. Car Shops* Lancaster, O.
(3) Ld. M. Div.: Ralph Peters, *Supt.* ..... Cincinnati, O.
Leroy Kells, *M. M.* ..... Cincinnati, O.
Jos. Underwood, *G. F. Car Shops* Cincinnati, O.
(4) J. M. & I. R. R.: E. W. McKenna, *Gen. Supt.* Louisville, Ky.
Wm. Swanston, *M. M.* ..... Jeffersonville, Ind.
Jos. Lescallett, *G. F. Car Shops* Jeffersonville, Ind.
(5) Indianapolis & Vincennes R. R.
J. J. Turner, *Supt.* ..... Indianapolis, Ind.
Pittsburgh, Cleveland & Toledo R. R.
4-8½ g. 78 m. 18 lo. 525 cars.
C. H. Andrews, *Pres.* ..... Youngstown, O.
W. C. Agnew, *Supt.* ..... Youngstown, O.
W. F. Hofecker, *M. M.* ..... Youngstown, O.
Pittsburgh, Ft. Wayne & Chicago Ry. (*See Penn. Co.*)
Pittsburg Southern Ry. (*See Balt. & O.*)
Pitts. & Allegheny R. R. 3-4 g. 9 m. 1 lo. 4 cars.
James M. Bailey, *Gen. Supt.* ..... Pittsburg, Pa.
Holmes Ward, *M. M.* ..... Castle Shannon, Pa.
Wm. E. Long, *M. C. B.* ..... Hazelwood, Pa.
Pitts. & Lake Erie R. R. 4-8½ g. 70 m. 31 lo. 1,830 c.
W. C. Quincy, *Gen. Man.* ..... Pittsburg, Pa.
R. W. Jones, *Mast. Trans.* ..... Pittsburg, Pa.
S. W. Haines, *M. M.* ..... Pittsburg, Pa.
Pittsburgh, McKeesport & Youghiogheny R. R.
4-8½ g. 57 m. 19 lo. 207 cars.
W. C. Quincy, *Gen. Man.* ..... Pittsburgh, Pa.
R. W. Jones, *M. of Trans* ..... Pittsburgh, Pa.
S. W. Haines, *M. M.* ..... Pittsburgh, Pa.
Pitts. & Western R. R. 4-8½ g. 110 m. 4 lo. 600 cs.
Pitts., Bradford & Buff. Ry. 3 g. 63 m. 8 lo. 163 c.
Tho. M. King, *Gen. Man.* ..... Allegheny, Pa.
J. T. Johnson, *Supt.* ..... Allegheny, Pa.
N. Bruce, *Pur. Agt.* ..... Allegheny, Pa.
W. M. Flahavian, *M. M.* ..... Allegheny, Pa.
Pontiac, Oxford & Pt. Austin R. R. 100 m.
Geo. W. Jennings, *Gen. Sup.* Oxford, Mich.
Jas. Houston, *Gen. Supt.* ..... Oxford, Mich.
Port Huron & No.-Western Ry. 3 g. 218 m. 14 lo. 286 c.
H. McMorran, *Gen. Pur. Agt.* Port Huron, Mich.
J. R. Wadsworth, *Supt.* ..... Port Huron, Mich.
Chas. Delfenbach, *M. M.* Port Huron, Mich.
Benj. Hillier, *M. C. B.* ..... Port Huron, Mich.
Port Jervis & Monticello R. R. 4-8½ g. 24 m. 3 lo. 15 c.
C. V. Hoiler, *Gen. Man.* ..... Port Jervis, N. Y.
Port Royal & Augusta Ry. 5 g. 180 m. 16 lo. 310c.
J. N. Bass, *Supt.* ..... Augusta, Ga.
T. F. Warwick, *M. M. & M. C. B* Augusta, Ga.
Portland & Ogdensburg. 4-8½ g. 110 m. 11 lo. 31 c.
J. Hamilton, *Gen. Supt & P. A.* ..... Portland, Me.
W. G. Brewer, *M. M.* ..... Portland, Me.
Portland & Rochester R. R. 4-8½ g. 52 m. 7 lo. 220 c.
J. W. Peters, *Supt. & Pur Agt.* Portland, Me.
H. C. Tompson, *For. of Mach.* Portland, Me.
David Dow, *For. of Car Repairs* Portland, Me.
Potomac, Fred. & Piedt. R. R. 3-8 g. 38 m. 4 lo. 6 cs.
Will M. Grafton, *Supt* ..... Fredericksburg, Va.
W. J. Sweigard, *M. M.* ..... Fredericksburg, Va.
Pough., Hart. & Dos. R. R. 4-8½ g. 40 m. 4 lo. 60 c.
J. A. Perkins, *Supt.* ..... Poughkeepsie, N. Y.
Prescott & Thirty-Fifth Parallel R. R.
4-8½ g. 77 miles in progress.
Samuel R. Callaway, *Gen. Man.* ..... Prescott, Ariz
Prince Edward Island Ry. 3-6 g. 199 m. 18 lo. 280 c.
Jas. Coleman, *Supt & Pur. Agt.*
Jos. Unsworth, *M. Supt. & Storekeeper;* and
D. M. Fraser, *M. C. B.* ..... Charlottetown, P. E. I.
Profile & Franconia Notch R. R. 3 g. 15 m. 1 lo. 3 cs.
Emmons Raymond, *Pur. Agt.* ..... Boston, Mass.
C. H. Greenleaf, *Supt.* ..... Profile House, N. H.
Prospect Park & Coney Island R. R.
4-8½ g. 15 m. 8 lo. 123 cars.
R. Schneider, *Gen. Supt.* ..... Brooklyn, N. Y.
Martin Painter, *M. M.* ..... Brooklyn, N. Y.
Prov., Warren & Bristol R. R. 4-8½ g. 19 m. 6 lo. 70 c.
Wm. Thurman Stone, *Supt.* ..... Bristol, R. I.
Rufus Smith, *M. M. & C. B.* ..... Bristol, R. I.
Prov. & Springfield R. R. 4-8½ g. 23 m. 3 lo. 12 cs.
Wm. Tinkham, *Gen. Man.* ..... Providence, R. I.
G. Y. Richardson, *M. M.* ..... Providence, R. I.
Prov. & Worcester. 4-8½ g. 66 m. 34 lo. 115 c.
W. E. Chamberlain, *Supt* ..... Providence, R. I.
Geo. F. Brown, *Gen. Supt.* ..... Providence, R. I.
Pullman's Palace Car Co. 594 passenger cars.
A. B. Pullman, *Sd V. Pr. & G. M.* ..... Chicago, Ill.
Geo. F. Brown, *Gen. Supt.* ..... Chicago, Ill.
Wm. A. Angell, *Pur. Agt.* ..... Chicago, Ill.
S. W. Brutsfield, *Asst. Pur. Agt.* New York, N. Y.
A. Rapp, Man. (Chicago Works) ..... Chicago, Ill.
H. L. Spaulding, Mas. (Des Moines Shops) Detroit, Mich.
E. A. Benson, *Supt. Shops* ..... St. Louis, Mo.

Q

Quebec Central Ry. 4-8½ g. 147 m. 10 lo. 267 cars.
J. R. Woodward, *Gen. Man.* Sherbrooke, P. Q.
A. Steele, *Supt.* ..... Sherbrooke, Que.
R. D. Morkill, *Jr., Pur. Agt.* Sherbrooke, P. Q.
Jas. Selveright, *M. M.* ..... Sherbrooke, P. Q.
Quebec, Montreal, Ottawa & Occidental Ry.
4-8½ g. 354 m. 90 lo. 963 cars.
L. A. Senecal, *Gen. Supt.* ..... Quebec, Que.
Quebec & Lake St. John Ry. 4-8½ g. 90 m. 4 lo. 55c.
J. G. Scott, *Manager* ..... Quebec, Can.
Frank Fournier, *Supt.* ..... St. Raymond, P. Q.
John T. Eames, *M. M.* ..... St. Raymond, P. Q.
Queen Anne's & Kent and Townsend Branch R. R.
(*See Penna.*) (4) *Div.*)

R

Raleigh & Augusta Air-Line; Carolina Central.
Raleigh & Gaston R. Rs. 4-8½ g. 436 m. 50 lo. 664 c.
John C. Winder, *Gen. Man. & P. A.* Raleigh, N. C.
Raleigh Rds. 4-8½ g. 104 m. 2 lo. 503 cars.
R. R. Harding, *Asst. Supt.* Raleigh, N. C.
Carolina Cen. R. R. 4-8½ g. 242 m. 26 lo. 431 c.
L. C. Jones, *Supt.* ..... Wilmington, N. C.
James Maglenn, *M. of Mach.* Laurinburg, N. C.
S. R. Ethridge, *M. C. B.* ..... Laurinburg, N. C.
Rensselaer & Saratoga R.R. (*See Del. & Hud. Can. Co.*)
Rhinebeck & Connecticut. (*See Hart. & Ct. Wn.*)
Richmond, Fredericksburg & Potomac R. R.
4-8½ g. 83 m. 15 lo. 146 cars.
E. T. D. Myers, *Gen. Supt* ..... Richmond, Va.
T. L. Courtney, *Asst. Supt* ..... Richmond, Va.
H. Kuhn, *M. M.* ..... Richmond, Va.
J. A. Graham, *M. C. B.* ..... Richmond, Va.
Richmond & Alleghany R.R. 4-9 g. 261 m. 19 lo. 837c.
Decatur Axtell, *Rec. & Gen. Man.* Richmond, Va.
M. Sweeney, *Pur. Agt.* ..... Richmond, Va.
Geo. D. Harris, *M. M. & C. B.* ..... Richmond, Va.
Richmond & Danville R. R. System.
1,736 miles 218 loco. 3,833 cars.
A. L. Rives, *Gen. Man.* ..... Richmond, Va.
Peyton Randolph, *As. G. Man.* Richmond, Va.
J. P. Minetree, *Pur. Agt.* ..... Richmond, Va.
R. D. Wade, *Gen. Sup.* ..... Richmond, Va.
(1) Rich. & Dan. R. R. 5 g. 847 m. 131 lo. 2,087 cars.
Rich. & Dan. Div. 5 g. 320 m. 50 lo. 1,707 c.
A. H. Wilson, *Supt.* ..... Richmond, Va.
T. W. Gentry, *M. M.* ..... Richmond, Va.
J. B. Wortham, *Pur. Car Sh.* Richmond, Va.
North Carolina Div. 5 g. 223 m. 22 lo. 268 cars.
A. B. Andrews, *M. M.* ..... Raleigh, N. C.
W. H. Turrentine, *M. M.* Comp's Shops, N. C.
J. C. Holt, *Pur. Car Sh.* Comp's Shops, N. C.
Atlanta & Char. Air-Line Div. 5 g. 315 m. 415 c.
Narrow-Gauge Branches. 3 g. 80 m. o lo. 41 c.
Emmet Hall ..... Atlanta, Ga.
W. A. Walden, *M. M.* ..... Atlanta, Ga.
Z. T. Smith, *Pur. Car Sh.* ..... Atlanta, Ga.
(2 Charlotte, Col. & Aug. R. R. 5 g. 220 m. 20 lo. 297 c.
G. R. Talcott, *Supt.* ..... Columbia, S. C.
J. R. Green, *M. Of roads* ..... Columbia, S. C.
(3) Columbia & Greenville R. R. 5 g. 297 m. 22 1 224 c.
G. S. Talcott, *Supt.* ..... Columbia, S. C.
J. O. Morrell, *Pur. & C. Rep.* ..... Columbia, S. C.
(4) Virginia Midland Ry. 4-8½ g. 353 m. 41 lo. 631 c.
W. M. Fahnestock, *Supt.* ..... Alexandria, Va.
J. E. Waddey, *M. of M.* ..... Alexandria, Va.
T. T. Nalls, *M. C. B.* ..... Alexandria, Va.
(5) Richmond & Petersburg R. R. 4-8½ g. 23 m. 0 lo. 182 c.
J. R. Kenly, *Supt.* ..... Richmond, Va.
John O'Brien, *M. M.* ..... Richmond, Va.
Rio Grande R. R. 3-6 g. 22 m. 3 lo. 40 cars.
M. J. Gomila, *Rec. & Gen. Man.* Brownsville, Tex.
G. W. Hustead, *Gen. Pur. Agt.* Brownsville, Tex.
M. Markwood, *M. C. B.* ..... Brownsville, Tex.
Rio Grande W. R. R. 3-6 g. 27 m. In progress.
W. W. Hungerford, *Man.* ..... Laredo, Tex.
Rochester & Lake Ontario Ry. 4-8½ g. 0 m. 2 lo. 10 c.
Joseph Harris, *Supt.* ..... Rochester, N. Y.
Rochester & Pittsb'g R. R. 4-8½ g. 260 m. 60 lo. 3,146 c.
Geo. B. Sanford, *Gen. Man.* Rochester, N. Y.
T. Gardiner, *Gen. Supt.* ..... Rochester, N. Y.
J. P. Hovey, *M. M.* ..... Rochester, N. Y.
J. R. Sherwood, *Sr. Sh.* ..... Rochester, N. Y.
Rock Island & Mercer County R. R., and
Rock Island & Peoria R. R. 4-8½ g. 131 lo. 357 c.
R. R. Cable, *V. P. & Gen. Supt.* Rock Island, Ill.
R. I. & P. Ry.: H. B. Sudlow, *Supt. & P. A.* do.
Joseph Bigelow, *M. M.* ..... Rock Island, Ill.
R. I. & M. C. Rd.: R. T. Cable, *Supt* R'k Island, Ill.
J. B. Parks, *M. M.* ..... Rock Island, Ill.
Rogersville & Jefferson R. R. 5 g. 16 m. 1 lo. 6 cars.
C. M. Leuty, *Supt* ..... Rogersville, Tenn.
Rome (Ga.) R. R. 5 g. 20 m. 2 lo. 37 cars.
Eben Hillyer, *Supt.* ..... Rome, Ga.
W. S. Harris, *M. M. & C. B.* ..... Rome, Ga.
Rome, Watertown & Ogdensburg R. R.
4-8½ g. 417 m. 61 lo. 1,831 cars.
H. H. Rogers, *Gen. Man.* ..... Oswego, N. Y.
Geo. H. Haselton, *S. M. P. & M.* Oswego, N. Y.
En'ds' Div.: J. D. Remington, *Asst. Supt.* Oswego, N. Y.
Wn Div.: W. H. Vincent, *Asst. Supt.* Oswego, N. Y.
Roodhouse & Scottsville Ry. In progress.
Geo. Sherman, *Gen. Man.* ..... Chicago, Ill.
Ruby Hill R. R. (*See Eureka & Pal.*)
Rumford Falls & Buckfield R. R. 4-8½ g. 21 m. 2 lo. 2 c.
L. L. Lincoln, *Supt. & Pur. Agt.* ..... Canton, Me.

S

Sabine & East Texas Ry. (*See Cen. Pac.*)
Sacramento Valley R. R. (*See Cen. Pac.*)
Saginaw Bay & Northw'n R. R. 4-8½ g. 31 m. 0 lo. 190 c.
J. T. Lilley, *Gen. Man.* ..... Pinconning, Mich.
Edward Keeler, *M. M.* ..... Pinconning, Mich.
Saginaw, Tuscola & Huron R. R.
3 g. 50 m. 3 lo. 83 cars.
E. McMillan, *Gen. Supt. & P. A.* Saginaw, Mich.
Saginaw Valley R. R. 4-8½ g. 30 m. 41. 64 c.
N. W. Merrill, *Supt.* ..... Saginaw, Mich.
Wm. Hoyt, *M. M.* ..... Saginaw, Mich.
Geo. C. Watrous, *M. M.* ..... Iona, Mich.
Salisbury R. R. 4-8½ g. 11 m. 1 lo. 1 car
R. G. Hatzer, *Supt.* ..... Pittsburgh, Pa.
Salt Lake & Western R. R. (*See Un. Pac.*) (6) *Div.*
San Francisco & San Joaquin R. R. 4-5½ g. 84 m. 5 lo. 545 c.
Arthur Hughes, *Gen. Man.* San Francisco, Cal.
H. C. Whiting, *Supt.* ..... Petaluma, Cal.
Wm. Hood, *M. M. & C. B.* ..... Petaluma, Cal.
Ed. Reynolds, *M. C. B.* ..... Donahue, Cal.
Sanborn, Cartersville & Southern R. R. In progress.
C. A. Roberts, *Gen. Man.* ..... Sanborn, Dak
Sandy River R. R. 2 g. 18 m. 3 lo. 30 cars.
W. H. Bent, *Pres. & Supt* ..... Phillips, Me.
M. Saunders, *M. M. & C. B.* ..... Phillips, Me.
Sandusk, Mansfield & Newark R. R. (*See Pitts. & O.*)
Sanford & Indian River R. R. (*See So. Flor.*)
San Luis Obispo & Santa Maria R. R.
Charles Goodall, *Man.* ..... San Francisco, Cal.
San Pedro R. R. 3 g. 33 m. 0 lo. 2 cars.
F. C. Hand, *Supt.* ..... Wales, U. T.
J. E. Bamberger, *Pur. Agt.* ..... Salt Lake, U. T.
B. Bates, *M. M.* ..... Salt Lake City, U. T.
(*See Su. Pac.; Nor'n Div.*)
Saratoga, Mt. McGregor & Lake Ry.
3 g. 11 m. 3 lo. 12 cars.
John McGee, *Supt.* ..... Saratoga Springs, N. Y.
Savannah, Florida & W. Ry. 4-8½ g. 155 m. 50 lo. 736 c.
H. S. Haines, *Gen. Man.* ..... Savannah, Ga.
H. Fitzhugh, *Supt.* ..... Savannah, Ga.
F. S. Pendergast, *Ch. Eng.* ..... Savannah, Ga.
A. A. Avellhé, *Pur. Agt.* ..... Savannah, Ga.
G. M. Hall, *M. M. & C. B. Mach.* ..... Savannah, Ga.
E. Giffen, *For. Car Dept.* ..... Savannah, Ga.
Say., Gulf & Ship. R. R. (*See Ga. by Sea and Riv.*)
Schuylkill & Lehigh R. R. (*See Phil. & Read.*)
Scoharie Valley R. R. (*See Albany & Susq.*)
Scioto Valley R. R. 4-8½ g. 132 m. 17 lo. 548 cars.
Geo. Skunner, *Supt. & P. A.* ..... Columbus, O.
J. A. Wallis, *Pur. Agt.* ..... Portsmouth, Va.
Seaboard & Roanoke R. R. 4-8½ g. 80 m. 21 lo. 384 c.
E. O. Ohio, *Mast. of Trans.* ..... Portsmouth, Va.
J. A. Wallis, *Pur. Agt.* ..... Portsmouth, Va.
M. M. Pendleton, *S. M. P. & M.* Portsmouth, Va.
Sedalia, Warsaw & Southern Ry. (*See Mo. Pac.*)
Sharpsville R. R. 4-8½ g. 23 m. 3 lo. 13 cars.
Walter Pierce, *Gen. Man.* ..... Sharpsville, Pa.
Shenandoah Valley R. R. 4-8½ g. 240 m. 32 lo. 849 c.
Norfolk & Western R. R. 5 g. 480 m. 82 lo. 1,779 c.
H. Shields, *Gen. Supt & P. A.* ..... Roanoke, Va.
W. C. De Armond, *Pur. Agt.* ..... Philadelphia, Pa.
Chas. Blackwell, *Supt. of M. P.* Roanoke, Va.
Sh. Val. Rd.: D. W. Flickwir, *Supt.* Roanoke, Va.
N. & S.: W. Div.: Frank Huger, *Supt.*; and
N. & W.: E. Div.: N. Osborne, *Supt.*; and
J. T. Robinett, *M. M.* ..... Petersburg, Va.
Shenango & Allegheny R. R. 4-9½ g. 97 m. 8 lo. 346 c.
J. T. Blair, *G. Man. & Pur. Agt.* Greenville, Pa.
Elw. Richardson, *M. M. & C. B.* Greenville, Pa.
Shepaug R. R. 4-8½ g. 38 m. 3 lo. 28 cars.
Edwin McNeill, *Supt.* ..... Litchfield, Ct.
F. J. Brought, *M. M.* ..... Litchfield, Ct.
Ship

Suffolk Lumber R. R. 3 g. 15 m. 3 lo. 41 cars.
W. M. Whaley, *Supt.* ..... Suffolk, Va.
Summit Branch R. R. 4-9 g. 39 m. 7 lo. 10 cars.
Thomas Ucker, *Supt.* ..... Williamsport, Pa.
Susquehanna & Delaware River R. R. In progress.
D. Y. Kilgore, *Pres.* ..... Philadelphia, Pa.
Sussex R. R. *(See Del., Lack. & West.)*
Syracuse, Binghamton & N. Y. R. R. *(See D. & H.)*
Syr., Ontario & N. Y. R. R. *(See N. Y., W.Sh.& Buf.)*
Syracuse, Geneva & Corning; Corning, Cowanesque & Antrim R. Rs. 4-8½ g. 143 m. 28 lo. 1,044 c.
A. H. Gorton, *Supt.* ..... Corning, N. Y.
W. E. Gorton, *Asst. Supt.* ..... Corning, N. Y.
Andrew Beers, *Pur. Agt.* ..... Corning, N. Y.
O. C. Patchell, *M. M.* ..... Corning, N. Y.
C. J. Butler, *M. C. R.* ..... Corning, N. Y.

**T**

Tennessee Coal R. R. 5 g. 28 m. 8 lo. 204 cars.
A. M. Shook, *Gen. Man.* ..... Tracy City, Tenn.
W. A. Knight, *M. M.* ..... Tracy City, Tenn.
Tennessee & Sequatchee Valley R. R.
3 g. 42 m. 1 lo. 34 cars.
Chas. Clinton, *Gen. Supt.* ..... Spring City, Tenn.
F. V. Mooney, *Pur. Agt.* ..... Spring City, Tenn.
Terre naute & Indianapolis R. R.
4-9 g. 398 m. 105 lo. 4,170 cars.
Joseph Hill, *Gen. Supt.* ..... St. Louis, Mo.
C. R. Peddle, *P. Agt.* ..... Terre Haute, Ind.
Geo. H. Prescott, *S. M. P. & M.* ..... Terre Haute, Ind.
E. D. Carter, *M. C. R.* ..... Terre Haute, Ind.
Chas. Butler, *M. M.* ..... Effingham, Ill.
Clinton Idler, *Foreman* ..... Indianapolis, Ind.
Terre Haute & So.-Eastern Ry. 4-9 g. 44 m. 2 lo. 145 c.
Geo. Atherton, *Supt.* ..... Terre Haute, Ind.
Texas Central Ry. *(See Hous. & Tex. Cen.)*
Texas Mexican Ry. *(See Mex. Nat.)*
Texas Trunk R. R. 4-8½ g. 36 m. 2 lo. 2 cars.
Hugh Irwin, *Gen. Supt.* ..... Dallas, Tex.
Texas Western Ry. 3 g. 52 m. 3 lo. 4 cars.
Henry Hatch, *Gen. Man.* ..... Houston, Tex.
T. F. Gilispie, *M. M.* ..... Houston, Tex.
Texas & N. O. R. R. *(See Cen. Pac.; G. H. & S. A. Divs.)*
Texas & Pacific. *(See Mo. Pac. Ry.; (6) Div.)*
Texas & St. Louis Ry. 3 g. 20 m. 84 lo. 1,200 cars.
W. R. Woodard, *Rec.* ..... St. Louis, Mo.
F. W. Paramore, *Pur. Agt.* ..... St. Louis, Mo.
G. W. Prescott, *S. M. P. & M.* ..... St. Louis, Mo.
A. E. Puchanan, *Supt.* ..... Pine Bluff, Ark.
Tex. Div.; J. T. Gerry, *Supt.* ..... Tyner, Tex.
Tionesta Valley R. R. 3 g. 15 m
George Dickinson, *Gen. Supt.* ..... Sheffield, Pa.
Tioga R. R. 4-8½ and 6 g. 67 m. 18 lo. 960 cars.
R. Dupuy, *Supt.* ..... Blossburg, Pa.
J. C. Guthrie, *Pur. Agt.* ..... New York, N. Y.
Penn Bonny, *M. M.* ..... Blossburg, Pa.
D. H. Stratton, *M. C. R.* ..... Blossburg, Pa.
Toledo, Ann Ar. & Gr. Tr. Ry. 4-8½ g. 63 m. 1 lo. 186 c.
J. M. Ashley, *Gen. Man.* ..... Ann Arbor, Mich.
W. W. Ashley, *Supt. & Pur. Agt.* ..... do
C. C. Dodge, *M. M.* ..... Ann Arbor, Mich.
Toledo, Cin. & St. Louis R. R. 3 g. 708 m. 101 lo. 3,500 c.
E. P. Murray, *Gen. Supt.* ..... Toledo, O.
F. W. Stewart, *P. Agt.* ..... Toledo, O.
L. W. James, *Supt. Mech.* ..... Delphos, O.
Toledo Div.: W. H. Vandergrift, *Supt.* ..... do
Thos. Robertson, *M. M.* ..... Delphos, O.
J. S. Wiers, *For. Car Agt.* ..... Delphos, O.
Del. & Cin. Divs.: C. A. Bell, *Supt.* ..... Cin, O.
T. J. Hamer, *M. M.* ..... Cincinnati, O.
So. D. & E. Div.: W. W. Cummings ..... Dayton, O.
W. H. Anderson, *M. M.* ..... Dayton, O.
St. Louis Div.: Frank P. Allen ..... Charleston, Ill.
P. H. Murphy, *M. M.* ..... Charleston, Ill.
Ironton Div.: J. C. O'Clark, *Supt.* ..... Ironton, O.
Toledo & Indianapolis R. R. 4-8½ g. 43 m. 4 lo. 118 c.
M. Clark, *Supt.* ..... Toledo, O.
H. H. Swan, *M. M.* ..... Toledo, O.
Toledo & South Haven R. R. *(See Pure Pow.)*
Tonawanda Val. & Cuba R. R. *(See Brad., D. & K.)*
Toronto, Grey & Bruce Ry. 4-8½ g. 191 m. 28 l. 446 c.
Edmund Wragge, *Gen. Man.* ..... Toronto, Can.
W. Watson, *Pur. Agt.* ..... Toronto, Can.
David Preston, *M. M.* ..... Toronto, Can.
Toronto & Nipissing Ry. *(See Mid. Ry. of Can.)*
Troy & Boston R. R. 4-8½ g. 48 m. 20 lo. 484 cars.
O. Robinson, *Pres. & Pur. Agt.* ..... Troy, N. Y.
Joseph Crandell, *Supt.* ..... Troy, N. Y.
Z. B. Davis, *M. M.* ..... Troy, N. Y.
H. V. Coon, *M. C. R.* ..... Troy, N. Y.
Troy & Greenfield R. R. & H. Tunnel. 4-8½ g. 44 m.
A. W. Locke, *Man.* ..... North Adams, Mass.
Tuckerton R. R. 4-9 g. 23 m. 2 lo. 29 cars.
J. J. Pharo, *Supt. & Pur. Agt* Tuckerton, N. J.

**U**

Ulster & Delaware R. R. 4-8½ g. 74 m. 10 lo. 214 cars.
Jas. H. Jones, *Supt.* ..... Rondout, N. Y.
Joseph Rush, *M. M.* ..... Rondout, N. Y.
John H. Decker, *M. C. R.* ..... Rondout, N. Y.
Union Pacific Ry. (7 Gen. Divs.)
3 & 4-8½ g. 4,633 m. 510 lo. 10,550 cars.
S. H. H. Clark, *Gen. Man.* ..... Omaha, Neb.
Thos. L. Kimball, *Asst. Gen. Man.* ..... Omaha, Neb.
M. H. Goble, *Pur. Agt.* ..... Omaha, Neb.
T. H. Congdon, *S. M. P. & C. D.* ..... Omaha, Neb.
John Wilson, *Asst. do* ..... Omaha, Neb.
(1) Neb. Div.; P. J. Nichols, *Gen. Supt.* ..... Omaha, Neb.
E. Dix; C. B. Havens, *Supt.* ..... Omaha, N. B.
R. McConnell, *M. M.* ..... Omaha, Neb.
A. B. Collett, *M. C. R.* ..... Omaha, Neb.
E. Sleppy, *M. M.* ..... G. Island, Neb.
L. Pole Div.: W. A. Deuel, *Supt.* ..... Cheyenne, W. T.
J. H. McConnell, *M. M.* ..... N. Platte, Neb.
R. McDougall, *M. M.* ..... Cheyenne, W. T.
(2) Wy. Div.; E. Dickinson, *Gen. Supt.* ..... Laramie, W. T.
T. E. Lewis, *M. M.* ..... Laramie, W. T.
T. A. Davis, *M. M.* ..... Rawlins, W. T.
Wes. Div.; C. E. Wurtelle, *Supt.* ..... Evanston, W. T.
Geo. F. Chapman, *M. M.* ..... Evanston, W. T.
3) Idaho Div.; W. B. Doddridge, *Gen. Supt.* Ogden, U.
F. Bearden, *M. M.* ..... Pocatello, Id.
Ogden Short Line Div.:
R. Bickenseiferfer, *Supt.* ..... Pocatello, Id.
Utah & Northern Div.:
W. F. F. St. Clair, *Supt.* ..... Eagle Rock, Id.
W. J. Hemphill, *M. M.* ..... Eagle Rock, Id.
W. J. Hemphill, *M. M.* ..... Eagle Rock, Id.
J. W. Paul, *Gen. For. C. D.* ..... Eagle Rock, Id.
4) Col. Cent. Div.; A. A. Egbert, *Gen. Supt.* Denver, Col.
C. Meirhimer, *M. M.* ..... Denver, Col.
C. C. Div.; F. Touby, *Supt.* ..... Denver, Col.
So. Park Div.; D. K. Sweet, *A. Supt.* Como, Col.
(5) Kan. Div.; S. T. Smith, *Asst. Gen. Supt.* Topeka, Ks.
K. Val. Div.; J. O. Brinkerhoff, *Supt.* Kan. Cy's, Mo.
Jas. Mackenzie, *M. M.* ..... Armstrong, Kan.
Kansas Central Div.
W. T. Kelley, *Supt.* ..... Leavenworth, Kan.
Smoky Hill Div.:
O. H. Dorance, *Supt.* ..... Wallace, Kan.
J. B. Dailey, *M. M.* ..... Ellis, Kan.
(6 Salt Lake & Western Div.:
W. W. Ritter, *Supt.* ..... Salt Lake City, Utah.
7) Nevada Central Ry. 3 g. 95 m. 4 lo. 78 cars.
F. W. Dunn, *Gen. Supt. & P. A.* Battle Mt., Nev.
C. T. Hughes, *M. M.* ..... Ellsworth, Nev.
United States Rolling Stock Co. 19 lo. 4,692 cars.
A. Hegewisch, *Pres.* ..... New York, N. Y.
C. H. Chaddock, *Gen. Agt.* ..... Chicago, Ill.
Upson County R. R. *(See Central of Ga.)*
Utah Central Ry. 4-8½ g. 280 m. 20 lo. 1,000 cars.
John Sharp, *Gen. Supt.* ..... Salt Lake City, Utah.
S. H. Hill, *Pur. Agt.* ..... Salt Lake City, Utah.
Geo. G. Bywater, *M. M.* ..... Salt Lake City, Utah.
Peter Reid, *M. C. R.* ..... Salt Lake City, Utah.
Utah & Nevada Ry. 3 g. 200 m. 84 lo. 1,000 cars.
W. W. Ritter, *Gen. Man.* ..... Salt Lake City, Utah.
Robert Anderson, *M. M.* ..... Salt Lake City, Utah.
Utah & Northern Ry. *(See Union Pac.; (3) Div.)*
Utah & Pleasant Valley Ry. *(See Den. & Rio. Gr.)*
Utica, Chenan & Elmira Ry. 4-8½ g. 120 m. 11 lo. 122 c.
Geo. S. Sadler, *Supt.* ..... Elmira, N. Y.
Edw. Mahler, *Pur. Agt.* ..... Elmira, N. Y.
C. J. Howe, *M. M. & M. C. R.* ..... Breesport, N. Y.
Utica, & Black Riv. R. R. 4-8½ g. 180 m. 32 lo. 450 c.
J. F. Maynard, *Gen. Supt. & P. A.* Utica, N. Y.
John Bailey, *M. M.* ..... Utica, N. Y.
David James, *M. C. R.* ..... Utica, N. Y.

**V**

Vaca Vall. & Clear Lake R. R. 4-8½ g. 30 m. 2 lo. 10 c.
G. R. Stevenson, *Gen. Supt.* ..... Vacaville, Cal.
Iley Ry. (Ohio) 4-8½ g. 85 m. 15 lo. 581 cars

J. E. Turk, *Supt. & P. Agt.* ..... Cleveland, O.
Chas. Blanchard, *M. C. R.* ..... Cleveland, O.
Valley R. R. Va. 4-8½ g. 63 m.
S. Spencer, *Pres.* ..... Baltimore, Md.
Vermont Valley R. R. *(See Conn. River.)*
Vicksburg & Brunswick R. R. *(See Ceva., of Ga.)*
Vicksburg & Meridian R. R. *(See Cin., N. O. & Tex. Pac.)*
Vicks. Shreveport & Pac. R. R. *(See G., N. O. & T. P.)*
Victoria Ry. *(See Midland Ry. of Can.)*
Virginia Midland Ry. *(See Rich. & Dan.; (4) Div.)*
Virginia & Truckee R. R. 4-8½ g. 21 m. 17 lo. 173 c.
Carson & Colorado R. R. 3 g. 294 m. 6 lo. 134 c.
H. M. Yerington, *Gen. Supt.* ..... Carson, Nev.
R. J. Laws, *Supt. C. & Ch.* ..... Hawthorne, Nev.
Hume Yerington, *Pur. Agt.* ..... Carson, Nev.
I. N. Harding, *M. M.* ..... Carson, Nev.
M. M. Hyde, *M. C. R.* ..... Carson, Nev.

**W**

Wabash, Chester & W'n R. R. *(See St. Louis Coal.)*
Wabash, St. Louis & Pacific Ry. (4 Gen. Divs.,
4-8½ g. 3,241 m. 508 lo. 17,230 cars.
A. L. Hopkins, *2d V. P.* ..... St. Louis, Mo.
Robert Andrews, *Con. Eng.* ..... St. Louis, Mo.
R. B. Dyer, *Pur. Agt.* ..... St. Louis, Mo.
Jacob Johann, *Gen. M. M.* ..... Springfield, Ill.
U. H. Kohler, *Gen. M. C. R.* ..... Toledo, O.
(1) Eas'n Div.; G. W. Stevens, *Supt.* ..... Peru, Ind.
J. B. Barnes, *M. M.* ..... Fort Wayne, Ind.
John McKenna, *M. M.* ..... Peru, Ind.
Cairo Div.; W. S. Morris, *M. M.* ..... Carmi, Ill.
Rant'l Div.; B. F. Mathias, *Asst. Supt.* Rantoul, Ill.
J. McCarthy, *M. M.* ..... Rantoul, Ill.
(2) Middle Div.; H. F. Clark, *Supt.* ..... Springfield, Ill.
H. Rose, *M. M.* ..... Decatur, Ill.
G. A. Hurd, *Asst. Supt.* ..... Forest, Ill.
(3) Northern Div.; E. N. Armstrong, *Supt.* Peoria, Ill.
R. M. Hemphill, *M. C. R.* ..... Peoria, Ill.
E. B. Hyde, *Asst. Supt.* ..... Havana, Ill.
(4) Western Div.; R. S. Miner, *Supt.* ..... Moberly, Mo.
W. H. Selby, *M. M.* ..... Moberly, Mo.
C. S. Buck, *M. C. R.* ..... Moberly, Mo.
E. Dresser, *Asst. Supt.* ..... Stanberry, Mo.
D. Moin, Div.; C. F. Meek, *A. Supt.* Des Moines, Ia.
Wabash Bridge & Iron Co. ..... Decatur, Ill.
John G. Scott, *Gen. Man.* ..... Jenks P. O., Tenn.
Walkill Ry. *(See N. Y., West. Sh. & Buf.)*
Walla Walla & Columbia Riv. R. R. *(See Ore. Ry.)*
Walton R. R. 5 g. 10 m. 1 lo. 7 cars.
D. H. Walker, *Pres.* ..... Monroe, Ga.
Warren & Farnsworth Valley R. R.
3 g. 2 m. 3 lo. 30 cars.
A. D. Wood, *Supt.* ..... Warren, Pa.
Warwick Valley R. R. *(See Leh. & Hud. River.)*
Wastch & Indian Valley R. R. *(See Den. & Rio Gr.)*
Washington, Ohio & West R. R. 4-8½ g. 52 m. 5 lo. 87 c.
S. M. Brophy, *Supt.* ..... Alexandria Va.
W. Mountjoy, *Act. For.* ..... Alexandria, Va.
John Harrison, *M. C. R.* ..... Alexandria, Va.
Waynesburg & Washington Rl. 3 g. 29 m. 2 lo. 30 c.
C. E. Bower, *Supt.* ..... Waynesburg, Pa.
A. M. Kline, *M. C. R.* ..... Waynesburg, Pa.
Welland Ry. 4-8½ g. 22½ m. 4 lo. 7 cars.
William Pay, *Supt.* ..... St. Catharines, Ont.
Jas. Taylor, *M. M.* ..... St. Catharines, Ont.
Wm. H. Pay, *M. C. R.* ..... St. Catharines, Ont.
West End Narrow Gauge Ry. 3 g. 16 m. 3 lo. 13 c.
Rolla Wells, *Supt.* ..... St. Louis, Mo.
M. M. Hodgman, *M. M.* ..... Florissant, Mo.
West Feliciana R. R. 4-8½ g. 27 m. 2 lo. 22 cars.
J. B. McGehee, *Pr. & Gen. Supt.* Bayou Sara, La.
J. A. Tilton, *M. M. & C. R.* ..... Bayou Sara, La.
W. Va., Central & Pittsb'g Ry. 3-8½ g. 70 m. 4 lo. 72 c.
T. B. Davis, *Gen. Man.* ..... Piedmont, W. Va.
W. E. Porter, *Gen. Supt.* ..... Piedmont, W. Va.
Geo. W. Harrison, *Pur. Agt.* ..... Piedmont, W. Va.
F. W. Lippencott, *M. M.* ..... Piedmont, W. Va.
West & East R. R. *(See Ill. Cent., (3) Div.)*
West Jersey R. R. *(See Penn. R. R.; (3) Div.)*
Western R. R. of Ala. 5 g. 20 m. 1 lo. 22 cars.
Atlanta & W. Point Rd. 5 g. 87 m. 14 lo. 240 c.
Cecil Gabbett, *Gen. Man. & Supt.* ..... Mont., Ala.
C. D. Wall, *M. M. & C. R.* ..... Montgomery, Ala.
Western Counties' Ry. 4-8½ g. 67 m. 8 lo. 137 cars.
J. Brignoli, *Supt.* ..... Petersburg, Va.
Western Maryland R. R. 4-8½ g. 157 m. 25 lo. 439 c.
J. M. Hood, *Pr. & Gen. Man.* ..... Baltimore, M. l.
R. J. Adair, *Pur. Agt.* ..... Baltimore, Md.
David Holtz, *Mast. of Mach.* Union Bridge, Md.
J. H. Nussear, *M. C. R.* ..... Union Bridge, Md.
Western No. Carolina R. R. 5 g. 210 m. 17 lo. 160 c.
Y. E. McBee, *Supt.* ..... Salisbury, N. C.
Jos. P. Minetree, *Pur. Agt.* ..... Richmond, Va.
G. W. Gates, *M. M.* ..... Salisbury, N. C.
Western & Atlantic R. R. 5 g. 138 m. 30 lo. 952 c.
R. A. Anderson, *Gen. Supt.* ..... Atlanta, Ga.
A. B. Bostwick, *Asst. Supt.* ..... Atlanta, Ga.
John H. Flynn, *M. M. & C. R.* ..... Atlanta, Ga
Wheeling, Pittsburg & Baltimore R. R. *(See B. & O.)*
Wheeling & Lake Erie R. R. 4-8½ g. 91 m. 31 lo. 1,450 c.
M. D. Woodford, *Gen. Man.* ..... Toledo, O
O. P. Dunbar, *Gen. M. M.* ..... Norwalk, O.
John Hillhouse, *Dir. M. M.* ..... Norwalk, O.
Cleve. & Mar. Div.:
A. Galloway, *Div. M. M.* ..... Cambridge, O.
Whitby, Port Perry & Lindsay Ry. *(See Mid. of Can.)*
White Water R. R. *(See Ft. W., Cin. & Lou.)*
Whitefield & Jefferson R. R. *(See Bos., Con. & Mon.)*
Whitneyville & Machinsport R. R. 8 m. 2 lo. 48 c.
C. Sullivan, *G. M. & P. Pur. Agt.* Whitneyville
Wicomico & Pocomoke R. R. 4-8½ g. 30 m. 2 lo. 38 c.
L. Showell, *Pres.* ..... Berlin, Md.
Williamsport & North Branch R. R.
4-8½ g. 9 m. 2 lo. 4 cars.
R. G. Welch, *Man. & P. Agt.* ..... Hughesville, Pa.
J. V. Chamberlain, *Supt. & M. M.* do.
Williamstown & Del. River R. R.
4-8½ g. 9 m. 1 lo. 10 cars.
Samuel Garwood, *Supt.* ..... Williamstown, N. J.
Wilmington, Columbia & Augusta R. R. 3 g. 90 m.
Wilmington & No'n R. R. 4-8½ g. 85 m. 16 lo. 148 c.
J. H. Thompson, *Supt. & P. A.* ..... Coatesville, Pa.
George Rommel, *M. M.* ..... Coatesville, Pa.
Alex. Maitland, *M. C. R.* ..... Coatesville, Pa.
Wilmington & Weldon; Northeastern; N. C. Central; Cheraw & Darlington; Cheraw & Salisbury; and Wilmington, Columbia & Augusta R. Rs.
5 g. 509 miles 70 locomotives 1,500 cars.
R. R. Bridgers, *Gen. Man.* ..... Wilmington, N. C.
J. F. Divine, *Gen. Supt.* ..... Wilmington, N. C.
John Bisset, *M. M.* ..... Wilmington, N. C.
W. H. Day, *M. C. R.* ..... Florence, S. C.
J. H. Davis, *M. C. R.* (W. & W.) ..... Wilmington, N. C.
Wilnfrede R. R. 4-9 g. 5 m. 1 lo. 65 cars.
Theodore Wright, *Pres.* ..... Philadelphia, Pa.
Windsor & Annapolis Ry. 4-8½ g. 130 m. 10 lo. 160 c.
F. Innes, *Gen. Man.* ..... Kentville, N. S.
Wm. Yould, *M. M.* ..... Kentville, N. S.
Wm. Grierson, *M. C. R.* ..... Kentville, N. S.
Wisconsin Central R. R. 4-8½ g. 480 m. 40 lo. 1,800 c.
F. N. Finney, *Gen. Man.* ..... Milwaukee, Wis.
E. K. Howes, *Pur. Agt.* ..... Milwaukee, Wis.
W. A. Short, *Supt. M. P. & M.* ..... Stevens Pt., Wis.
Mil. & E'n Divs.; A. A. Allen, *S.* ..... Milwaukee, Wis.
Wis., Minn. & N. W. Div.;
W. E. Carroll, *Supt.* ..... Stevens Point, Wis.
Wisconsin, Iowa & Nebraska.
G. C. McMichael, *Supt.* ..... Marshalltown, Ia.
Wisconsin & Michigan R. R. *(See Mil. & North'n.)*
Wisconsin & Minnesota R. R. *(See W. Wis.)*
Wood River Branch R. R. 4-8½ g. 6 m. 2 lo. 3 cars.
L. M. Barber, *Supt.* ..... Valley Jc. Ill.
Woodstock R. R. 4-8½ g. 14 m. 1 lo. 3 cars.
J. G. Porter, *Supt.* ..... Woodstock, Vt.
Worcester & Nash. R. R. *(See Bos., Mil. & Va.)*
Worcester, Nashua & Rochester R. R.
4-8½ g. 95 m. 20 lo. 225 cars.
C. S. Turner, *Pres. & G. Man.* Worcester, Mass.
G. W. Hurlburt, *Supt.* ..... Worcester, Mass.
John G. Brady, *M. M. & C. R.* Worcester, Mass.
Worcester & Shrewsbury R. R. 3 g. 3 m. 3 lo. 9 c.
J. J. Coburn, *Supt.* ..... Worcester, Mass.
G. E. Hapgood, *Pur. Agt.* ..... Worcester, Mass.
Chas. Cleveland, *M. M.* ..... Worcester, Mass.
Worcester & Somerset R. R. *(See N. Y., Phil. & Nor.)*

**Y**

York & Peach Bottom Ry. 3 g. 40 m. 4 lo. 74 c.
S. M. Manifold, *Supt. & Pur. Agt.* ..... York, Pa.
S. J. Williams, *M. M.* ..... York, Pa.
Youghlogheny R. R. 4-9 g. 12 m.
W. m. Wilson, *Supt.* ..... Irwin's, Pa


WILLIAMSON & CASSEDY.
Railway, Machinists' and Steamship
SUPPLIES OF EVERY DESCRIPTION.
24 South Fourth Street,
PHILADELPHIA.

JOHN T. LEWIS & BROS. PURE WHITE LEAD. PHILADA.
TRADE MARK.
No. 231 South Front Street.
Manufacturers of White Lead, Red Lead, Litharge, Orange Mineral, Linseed Oil and Painters' Colors.

American Bronze Works
J. W. Heiser, Proprietor.
MANUFACTURER OF

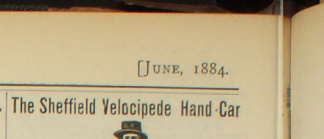
BRONZE AND BRASS BEARINGS.
Car and Locomotive Work a Specialty.
23 Columbus Street, Cleveland, Ohio.

THE STANDARD LUBRICATING OIL OF AMERICA FOR RAILROADS.
GALENA
ENGINE, COACH AND CAR OIL.
Gravity, 26°, 27°, 28°, 29°. Cold Test, 10° to 15° Below Zero.
No freezing in coldest weather, and entire free dom from hot journals at any time, as its exclusive use upon a majority of the leading railroads has demonstrated.
Showing Better Results than any Oil Extant
REFERENCES FURNISHED ON APPLICATION.
GALENA OIL WORKS (Limited),
FRANKLIN, PA.

ELEVATORS FOR MILLS.
Send for Catalogue to
Cohoes Iron Foundry & Machine Co.
COHOES, N. Y.

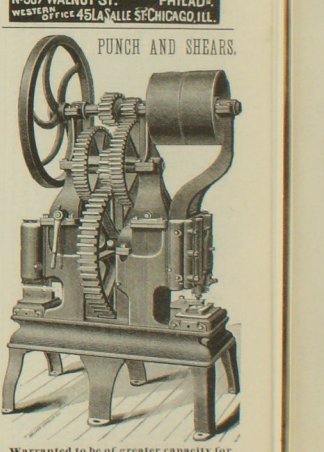
PORTABLE FORGES.
Send for Catalogue to
EMPIRE PORTABLE FORGE CO.,
COHOES, N. Y.

THE BABCOCK & WILCOX CO.,
WATER TUBE STEAM BOILERS.
107 Hope St., GLASGOW. | 30 Cortlandt St NEW YORK.
BRANCH OFFICES:
BOSTON: 50 Oliver St.
PHILADA.: 32 N. 5th St.
PITTSBURGH: 98 4th Ave
CHICAGO: 64 S. Canal St
CINCINNATI: 64 W. 3d St.
St. Louis: 207 Market St.
NEW ORLEANS:
54 Carondelet St.
SAN FRANCISCO:
501 Mission St.
HAVANA: 50 San Ignacio.
THE BABCOCK & WILCOX COMPANY
Send to nearest office for circular.

The Sheffield Velocipede Hand-Car

This Hand-Car is especially adapted to the use of Road-Masters, Bridge Inspectors, Telegraph Line Repairers, Track Inspectors, Track Walkers, Wood and Tie Inspectors and for all work where one or two men wish to go over the line at will. Also, our Telegraph Cars, capable of carrying two men and material. Light, Easily Handled, and when ready for shipment occupy very little space in Baggage Car—a great advantage to railroad men. Run easily, being propelled by the ROWING MOVEMENT. Can be run short distances at the rate of 20 Miles an hour; and will not jump the track.
HENRY W. PEABODY & CO.,
114 STATE STREET, BOSTON,
GENERAL PURCHASING AGENTS
For Foreign Railway and Tramway Companies

A. DEMAREST, JR.
ENGRAVER ON WOOD
179 BROADWAY
(BET. CORTLANDT & DEY ST'S.)
NEW-YORK

STEEL CASTINGS.
RAIL-ROAD AND MACHINE CASTINGS
OF ALL KINDS FROM ¼ LB TO 10 TON.
LOCOMOTIVE CROSS HEADS AND GEARING A SPECIALTY.
EUREKA CAST STEEL CO.
No 307 WALNUT ST. PHILAD'A.
WESTERN OFFICE 45 LA SALLE ST. CHICAGO, ILL.

PUNCH AND SHEARS.

Warranted to be of greater capacity for the price than any other machine in the market. Send for circular.
G. D. COLTON & CO., GALESBURG, ILL.
Correspondence solicited. State where you saw this ad'v.

THE LAKE SHORE & MICHIGAN SOUTHERN RAILWAY COMPANY.
CLEVELAND, O., April, 1884.
This company desires to sell the following described engines for cash. The Boilers of these Engines are all in good condition, and the Engines are in good working order. For further information address
A. C. ARMSTRONG,
Purchasing Agent L. S. & M. S. Ry.

| By whom Built. | Engine. | Cylinders. | | Drivers. | | Weight. | | Coal or wood burners. | Value. |
|---|---|---|---|---|---|---|---|---|---|
| | | Diam. | Stroke. | No. | Diam. | On Engine. | On Driv's | | |
| Boston Lo. Works | 2 | 15 | 20 | 4 | 5 | 50,700 | 33,700 | Wood. | $2,000.00 |
| Swimburne | 39 | 16 | 22 | 4 | 4.10 | 57,000 | 36,000 | Coal. | 4,000.00 |
| " | 40 | 15 | 22 | 4 | 4.10 | 57,000 | 35,000 | " | 3,800.00 |
| M. S. & N. I. Ry | 53 | 15 | 20 | 4 | 5 | 58,000 | 33,000 | " | 4,200.00 |
| " | 88 | 16 | 22 | 4 | 5 | 60,000 | 36,000 | " | 4,000.00 |
| Amoskeag | 228 | 15 | 22 | 4 | 5 | 57,000 | 35,000 | " | 3,500.00 |
| N. J. Lo. Works | 233 | 16 | 22 | 4 | 5 | 60,000 | 35,000 | " | 3,500.00 |
| Amoskeag | 406 | 16½ | 22 | 4 | 5 | 59,000 | 36,000 | " | 3,500.00 |
| L. S. & M. S. Ry | 217 | 16 | 22 | 4 | 5 | 58,000 | 36,000 | " | 3,500.00 |
| Cuyahoga | 220 | 16 | 22 | 4 | 5 | 55,000 | 30,000 | " | 3,000.00 |
| L. S. & M. S. Ry | 227 | 16 | 22 | 4 | 5 | 58,000 | 36,000 | " | 3,500.00 |
| " | 229 | 16 | 22 | 4 | 5 | 58,000 | 36,000 | " | 3,500.00 |
| Manchester | 230 | 16 | 22 | 4 | 5 | 57,000 | 36,000 | " | 3,500.00 |
| Cuyahoga | 201 | 16 | 22 | 4 | 5 | 58,000 | 36,000 | " | 3,500.00 |
| L. S. & M. S. Ry | | | | | | | | | |

# UNION STONE COMPANY,

38 and 40 HAWLEY ST., BOSTON, MASS.,

PATENTEES AND MANUFACTURERS OF THE

## UNION EMERY WHEEL.

UNION STONE COMPANY'S SWING FRAME Grinding & Polishing Machine.

To be suspended from overhead.

Especially adapted for Foundries and large Machine Shops.

Emery Wheel Machinery and Tools a Specialty.

Automatic Knife-Grinding Machines.

WOOD-POLISHING WHEELS,

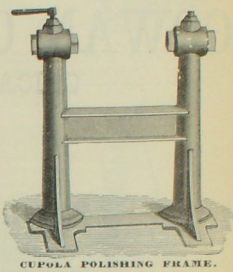
EMERY, QUARTZ, CORUNDUM,

GRINDERS' AND POLISHERS' SUPPLIES.

Catalogue on Application.

The work is placed on the floor, bench or truck, the emery wheel is swung at will to conform to the straight or uneven surface. The wheel, being driven from a swinging counter-shaft, suspended by a telescopic rod with a universal joint, may be carried back and forth or swung at will; and the frame carrying the wheel being also suspended by the counterpoise weights jointed to a similar horizontal telescopic rod, makes it easy to twist the wheel over to any angle or give it any range of movement up or down. The operator can seize the handles on each side of the wheel, and carry it to any portion of the work desired. A boy can operate it. By substituting a circular "Scratch Brush" for the wheel, its value in the cleaning room of a foundry is apparent to all familiar with the old laborious hand process.

The machine is also a valuable accession to the machinery of any general machine shop, for grinding off fins, spurs and imperfections, instead of chipping and filing. It leaves the work looking better, and may be performed by a cheaper hand; and by substituting a polishing wheel for the grinding wheel, the work can be finished to a fine polish.



CUPOLA POLISHING FRAME.

E. T. BARNUM, Pres. and Gen. Mgr. PHILO PARSONS, Vice-Pres. F. H. LEAVENWORTH, Secretary. C. F. PURDIE, Superintendent.

[Established 1863.] [Incorporated 1882.]

## E. T. BARNUM WIRE AND IRON WORKS, DETROIT, MICH., U. S. A. Chicago, Ill.—Windsor, Ont.

MANUFACTURERS OF

WIRE AND IRON WORK OF EVERY DESCRIPTION.

WE MAKE A SPECIALTY OF LOCOMOTIVE SPARK-NETTING, OFFICE RAILINGS, TICKET WINDOWS, WICKETS, BUILDERS' IRON WORK, WIRE ROPE.

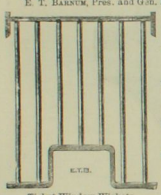
Fire Extinguishers for Depots, Ticket Pockets for Freight Cars, Brass Wire Cloth, etc., etc.

☞ WE MAKE STRICTLY FIRST-CLASS WORK, and are prepared to make low estimates.

☞ SEND FOR OUR CATALOGUE. ☜

Iron Beds for Construction Trains and Depots.

IRON AND IRON-AND-WOOD SETTEES FOR DEPOTS.



Ticket Window Wickets.

Fire Extinguishers.

ORNAMENTAL WROUGHT-IRON FENCES FOR DEPOT ENCLOSURES.

Roof Cresting Finials and Tower Ornaments.

IRON DOORS AND SHUTTERS. WIRE DEPOT SIGNS.

Works and General Offices:

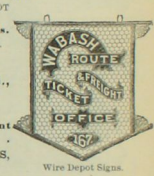
Cor. Howard St. and Wabash Ave., Detroit, Mich.

Chicago Branch: 110 Lake St., Chicago, Ill.

Canadian Branch: 65 Sandwich St., Windsor, Ont.

Address all correspondence to

E. T. BARNUM WIRE & IRON WORKS, Detroit, Mich., U. S. A.

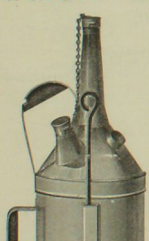



Wire Depot Signs.

NOYES'

# Patent Liquid and Condensed COOLER.

For Cooling Railroad Car and Steamboat Journals and Bearings of all Kinds, and for Mixing with Other Oils.



The attention of those who are running heavy journals is respectfully invited to the above Liquid Cooler. It has been successfully used for upward of ten years, and is constantly growing in favor as its merits become known, and we are confident that practical men cannot fail of being convinced that our preparation deserves their candid attention. What we claim for it is:

**That it will Cool a Hot Journal When in Motion,** and extinguish the flame when the box is on fire; that its use will, in a great measure, prevent the occurrence of a hot journal and save the expense, delays and annoyances incident thereto; that it will eliminate the heat from a journal at a temperature greatly below the point required to melt the babbitt, preventing the accumulation of heat, and by a timely application save it from destruction; that its non-inflammable elements (where waste is used) permeate the waste and prevent its taking fire; that it keeps the journal smooth and polished, preventing unnecessary friction; that its combination is based upon true scientific principles which render it impossible to fail in its results, and is the

**Only Preparation that will Cool a Hot Journal** while it is in motion, as attested by certificates below; that its thorough application on a hot journal will do more execution in cooling than the constant application of water for half an hour, besides doing it evenly and without loss of time.

**Every Railroad Train or Steamboat** should have a can of the Liquid packing on board, with the directions for its use pasted upon it, and thus have always at hand the means of effectually cooling a hot journal, and thereby avoid the expense, danger and trouble from this cause.

## WHAT RAILROAD MEN SAY OF IT.

SALEM, AUG. 7, 1872.

MR. P. NOYES.—*Dear Sir;* I have been using your Liquid Packing for cooling car journals for some time past and have been well pleased with it. I have had occasion to use it a number of times, under Pullman cars, and it has been a complete remedy in every case of hot journals.

J. P. SOMERBY,
M. C. R. Eastern Railroad.

(COPY).

CLEVELAND, O., June 9, 1883.

NOYES MFG. CO., Boston, Mass.—Please furnish on account of this company and send invoices in duplicate direct to my address, 5 barrels Noyes' Patent Liquid Cooler. Mark packages: A. C. Robson, Buffalo, N. Y.; F. O. Bray, Adrian, Mich.; A. Merritt, Cleveland, O.

Yours truly,
(Signed) A. C. ARMSTRONG,
Gen'l Purchasing Agent L. S. & M. S. Ry. Co.

SALEM, Aug. 28, 1880.

I can recommend Noyes' Liquid Cooler as an excellent article to carry on trains for use in case of Hot Journals, which it cools without injury to the journals more effectually than anything I knew of.

J. B. BILLINGS,
M. C. R. Eastern Railroad.

BOSTON, April 7, 1880.

P. NOYES, Agent.—*Dear Sir.* Please send for account of Eastern Railroad five barrels Liquid Cooler.

Yours truly,
GEO. J. FISHER, P. A.

BOSTON, May 24, 1877.

P. NOYES, Agent.—*Dear Sir:* Having used your Liquid Cooler two or three years I find it necessary for the safe running of our cars to continue its use. When the cooler is mixed with black oil, according to directions, the compound is equal to lard or sperm oil, and it is the best Cooler I have ever used.

Yours truly,
JOHN F. CROCKETT,
Master Mechanic Boston, Lowell & Nashua R. R.

BOSTON, April 23, 1880.

NOYES MFG. CO.—*Gents:* Please send to East Cambridge, for account Boston & Lowell Railroad, five barrels Liquid Cooler.

Yours truly,
F. H. NOURSE,
Purchasing Agent.

Our Liquid Cooler is now in use, and has been from one to eight years, upon the following roads, and we have numerous recommendations from them: Boston & Maine R. R., Boston & Lowell R. R., Chi., Wabash & Mich. Ry., Boston, Concord & Montreal R. R., Fitchburg R. R., Eastern R. R., New York, New Haven & Hartford R. R., New York & New England R. R., Connecticut River R. R., Scioto Valley R. R., Old Colony, Lake Shore & Michigan Southern Ry. Co.

**In ordering state whether it is desired for general Lubricating or Cooling. The Condensed is sold, especially for Lubricating, by the Pound and the Liquid by the Gallon, as low as any article of the quality in the market.**

SEND FOR A BARREL. NO CHARGE UNLESS IT DOES ALL WE STATE.

MANUFACTURED BY THE

## NOYES MANUFACTURING CO., P. Noyes, General Manager,

47 INDIA STREET, BOSTON.

*We are sole agents for the Improved Car Axle-Box Dust Guard and are Agents for the Ormsby Patent Car-Sash Balance and Lock.*

## THE BUFFALO STEEL FOUNDRY, BUFFALO, N. Y.

ORDERS AND CORRESPONDENCE SOLICITED. | PRATT & LETCHWORTH, Proprietors.

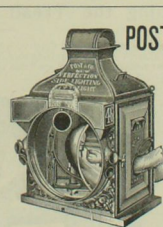
## POST & COMPANY'S

Pat'd Nov. 23, '69; Apr. 29, '73; July 15, '05; June 4, '78; Dec. 12, '82.

*NEW PERFECTION*

SIDE-LIGHTING HEAD-LIGHT,

Largest AND **BEST** Head-Light MADE.



View showing Side Signals, Numbers and Nicholson's Pat. Colored Signals, with Reflector turned in position for lighting. No more lanterns required on Engines.

View showing Manner of Mounting Reflector, and New Oil Reservoir.

**The New Reservoir** is constructed on our **American Student Lamp principle,** which keeps the oil at a **constant level** until **all is consumed,** thereby saving 2 inches of each **wick,** and it overcomes the **unsteadiness** of the flame, caused by **splashing** of the large body of oil in the reservoirs of ordinary **Head-Lights out to be refilled.** This reservoir can be **readily taken** Send for Circular of

REVOLVING AND STATIONARY LIGHTS.

## POST & CO.,

*Patentees and Manufacturers,* CINCINNATI, OHIO.

## $$$$ SAVED $$$$

## 1977 NINETEEN HUNDRED SEVENTY-SEVEN 1977

# MACHINES

BOTH NEW AND SECOND-HAND

COMPRISING

MACHINE AND BLACKSMITH TOOLS OF EVERY DESCRIPTION.

WOOD-WORKING MACHINERY IN ALL ITS BRANCHES. PORTABLE ENGINES. UPRIGHT and HORIZONTAL STATIONARY ENGINES, 1 TO 300 HORSE POWER. **S.C.F.&CO.** LOCOMOTIVE FIRE BOX, HORIZONTAL, and UPRIGHT BOILERS, 1 TO 100 HORSE POWER. WATER WHEELS, COTTON AND WOOLEN MACHINERY, STEAM PUMPS, GRISTMILL MACHINERY, Etc., FULLY DESCRIBED, AND PRICES ANNEXED,

☞ Send stamp for same.] In our List No. 23. [stating what you want. ☜

We have the Largest Assortment of Machinery to be found in the hands of any firm in the country.

Works and Main Office, Worcester, N. H.

## S. C. FORSAITH & CO.

Branch Office and Wareroom, 209 Center street, New York City.

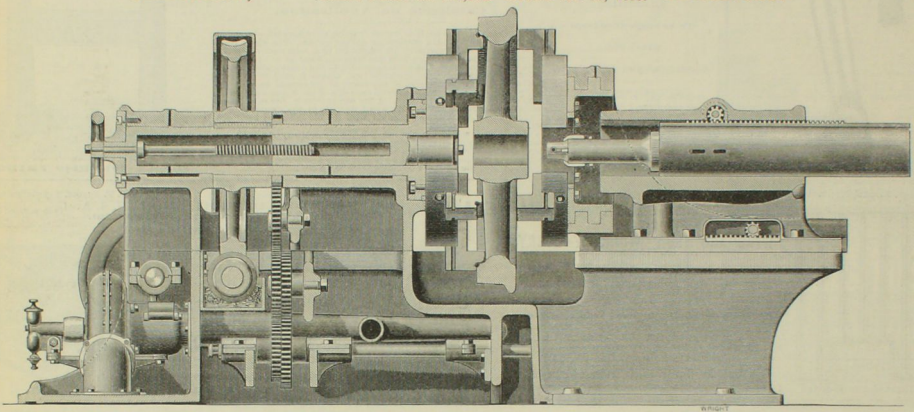
# THE GOWAN

# CAR WHEEL CENTERING, BORING AND TRUING MACHINE,

MANUFACTURED AND SOLD EXCLUSIVELY BY THE

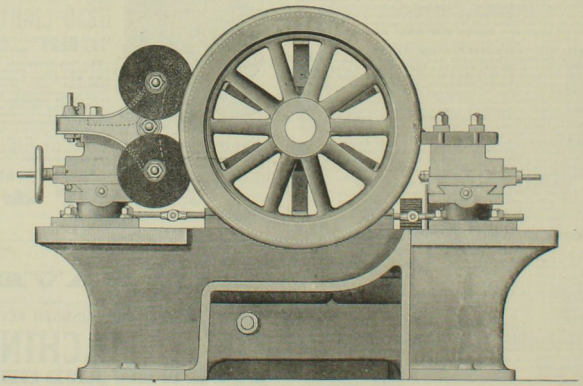
# GOWAN CAR WHEEL TOOL COMPANY,

CHICAGO, Under { Letters Patent No. 285,123. Granted Sept. 18, 1883. / Letters Patent No. 287,762. Granted Oct. 30, 1883. } ILLINOIS.



Great Economy of Time, Labor, Tools, Power and Shop Space. The Mileage of Wheels Largely Increased and Flange Wear Greatly Decreased. The Only Machine Capable of Boring the Hub and Truing the Tread of a Car Wheel at One Operation.

It will True (boring simultaneously) a chilled iron wheel in less time and deprive its tread of less of its integrity than any other Truing Machine in existence.
It will simultaneously Bore and True a steel-tired wheel *with greater rapidity and cut away less of its tread* than any known tool, or system of tools, for such purpose.
It will Bore a Chilled-Iron or Steel-tired Wheel *without truing the tread*, or True the tread *without boring;* embodying in combination, or independently, all the requisites of a Boring Mill, Chilled Car Wheel Grinding Machine and Tire Lathe.



## Master Mechanics and Master Car-Builders fully appreciate the following Facts:

That wheels can not be cast to a true circle, and though registering exactly the same circumference in the rough, invariably differ in size when relieved of their peripheral irregularities.
That if circumferentially matched rough Cast Wheels are bored and pressed upon their axle, one wheel of the pair being more oval than its fellow, and becoming the smaller of the pair, when both are reduced to a round, the best wearing surface must necessarily be cut from the chilled tread of the other and best wheel, in order to make it conform in size to its mate.
It prepares the wheel for its axle; circumferential *admeasurement for pairing being made after wheels are bored and trued.*
It is a Simple, Compact and Reliable Machine, weighing 17,000 pounds, and occupying a floor space 10 × 8 feet.
No. of wheels, 4: Guaranteed capacity on Steel or Steel-tired Wheels in ten hours, bored, turned and paired.
30 to 35: Guaranteed capacity on 33-inch Chilled Iron Wheels in ten hours, bored, ground and paired.
Special abrading wheels of superior quality, guaranteed, furnished for Steel and Chilled Iron Car Wheel Grinding and General Shop use.

FOR FURTHER PARTICULARS ADDRESS

## THE GOWAN CAR WHEEL TOOL COMPANY,

P. O. Drawer 176. CHICAGO, ILL.

MANUFACTURERS OF

**RAILWAY SPRINGS.**

15th and Pennsylvania Ave.,
PHILADELPHIA, PA.

H. L. LEACH Agt., 77 Water St., BOSTON, MASS.

NATHAN H. DAVIS, Prest. LEWIS C. GRATZ, Treas. PUSEY A. WALTON, Manager

**DIAMOND STATE CAR SPRING CO.**

WORKS: WILMINGTON, DELAWARE. OFFICES: 411 & 413 WALNUT ST., PHILA.

LICENSED TO MANUFACTURE EDGE ROLLED SPRINGS OF EVERY VARIETY.

ELLIPTIC, LOCOMOTIVE,

Flat and Round Bar Car Springs.

SPIRAL SPRINGS OF EVERY DESCRIPTION.

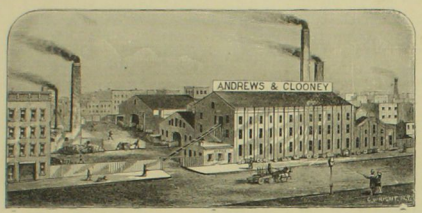
Davis' Patent Bolster Draw, BUFFER AND EQUALIZING SPRINGS.

"WALTON" BAND FOR LOCOMOTIVE SPRINGS.

VULCAN JOURNAL BEARINGS.

**ANDREWS & CLOONEY,**

GLOBE IRON AND COLUMBIA CAR SPRING WORKS.




Office, 545 West Thirty-third Street; Works, 535 to 551 West Thirty-third Street and 538 to 552 West Thirty-fourth Street,

NEW YORK.

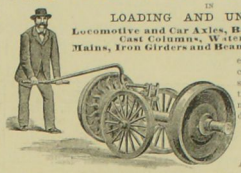
Manufacturers of Elliptical, Spiral, Volute Car and Engine Springs, Car Wheels, Axles, Pedestals Brake Shoes, Boxes, Brass Bearings and Castings of all descriptions where great strength is required. Also, Sweepers Snow Plows, Turn-tables, Automatic Switches, Track Work, &c.

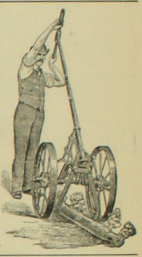
THIS TRUCK IS AUTOMATIC

IN

LOADING AND UNLOADING

Locomotive and Car Axles, Bar Iron, Shafting, Cast Columns, Water and Gas Mains, Iron Girders and Beams, Timber, Stone,





etc., and is universally conceded to be the most simple, ingenious, effective, durable and economical machine yet produced.

FOR ILLUSTRATED CATALOGUE

Address

**JOHN TERHUNE, Manager,**

Automatic Truck Works,

P. O. Box 19. MIDLAND PARK, N. J.

JAMES JEFFRIES & SONS,

MANUFACTURERS OF

**ELLIPTIC & HALF ELLIPTIC CAST-STEEL SPRINGS,**

For Railroad Cars and Locomotives.

813 JAYNE STREET, PHILADELPHIA, PA.

# DETROIT STEEL AND SPRING WORKS,

MANUFACTURERS OF

OIL TEMPERED

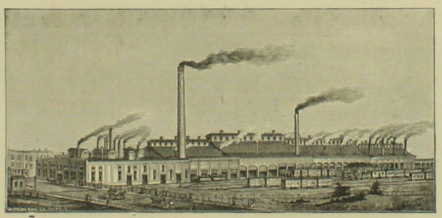
RAILWAY, CAR

AND

LOCOMOTIVE,

ELLIPTIC AND SPIRAL

SPRINGS,



OF

CRUCIBLE CAST

STEEL,

And Steel of Every

Description.

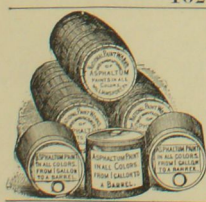
DETROIT, MICH.

ALEX. DE LANO, President. CHAS. P. CHOATE, Vice-Pres. H. R. NEWBERRY, Sec.

CHARLES SCOTT.

**ELLIPTIC AND SPIRAL SPRINGS FOR RAILWAY CARS AND LOCOMOTIVES.**

1028 TO 1038 NEW MARKET STREET. PHILADELPHIA.



NATIONAL PAINT WORKS

WILLIAMSPORT, PA.

ONLY MANUFACTURERS OF

**Asphaltum Paints**

MIXED READY FOR USE.

IN ALL COLORS. Adopted and being used by many Prominent Railroads Car and Bridge Builders in the United States. Using only the best Leads, Zincs, Minerals, proportion of Crude Asphaltum and all Coloring Materials, Ground in and Thinned with Pure Linseed Oil. Particular attention given to Railroad Car and Bridge Works Orders. Samples and Price-List furnished on application.

**PLANERS, LATHES,**

RADIAL DRILLS,

MANUFACTURED TO

STANDARD GAUGES

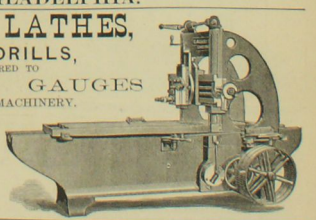
WITH SPECIAL MACHINERY.

EVERY MACHINE BELTED AND TESTED

G. A. GRAY, JR., & CO.,

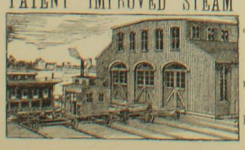
N. E. Cor. 8th and Sycamore

CINCINNATI, OHIO.



ROBINSON'S

PATENT IMPROVED STEAM POWER TRANSFER TABLE.



Only two men required to handle the table and cars.

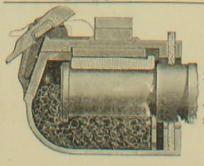
Tables Built to Order.

Power Applied to Tables Now in Use.

Awarded Silver Medal at the National Railway Exposition, Chicago, 1883.

N. W. ROBINSON, Mechanical Engineer.

ROOM 408, FIRST NATIONAL BANK BUILDING, CHICAGO ILL.



**THE HEWITT BOX-LID CO.,**

142 DEARBORN ST.,

CHICAGO, ILL.

Eastern Office: Room 14, Fifth Floor, Mills Building, New York.

We respectfully refer you to the following railroads using the Hewitt Cover:

K. C., St. J. & C. B., M. R., P. L. S. & D. C., B. & Q., C. A. & St. L., A. & S. F., A. & N., K. P., F. & P. M., D. L. & N., D. & R. G., M. C., H. & St. J., C. & V., St. L. M. & S., B. & M. R. (in Neb.), D. P., L. L. & G., L. E. & W., L. V. & Ch. G., C. & E. I., C. R. I. & P., C. H. V. & T. H., St. P. & S., N. Y. C. & R. I., M. P.

# PARROTT VARNISH COMPANY,

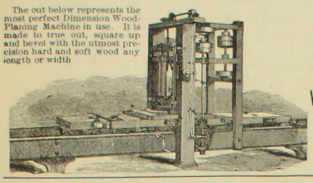
MANUFACTURERS OF FINE

# RAILWAY VARNISHES,

BRIDGEPORT, CONN.

---

DANIELS PLANERS.



The cut below represents the most perfect Dimension Wood-Planing Machine in use. It is made to true out, square up and bevel with the utmost precision hard and soft wood any length or width

## WOOD-WORKING MACHINERY,

MANUFACTURED BY

WITHERBY, RUGG & RICHARDSON, Worcester, Mass.,

26 SALISBURY STREET. (Shop formerly occupied by R. BALL & CO.)

SPECIALTIES:

Woodworth Planing, Tonguing and Grooving Machines, Daniels Planers, Richardson's Patent Improved Tenon Machines, Mortising, Molding, Re-saw and Band Saw Machines, Picture Frame and Miter Cutting Machines, Box Machinery,

PATENT DOUBLE SAW BENCHES, SAW TABLES &c.

---

## THE PATENT SHAFT AND AXLETREE CO.

(LIMITED),

OF WEDNESBURY, ENGLAND,

MANUFACTURERS OF

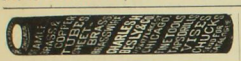
Wrought-Iron Steel Tyred Engine and Car Wheels, Iron and Steel Axles, Locomotive and Car Wheel Tyres, Etc., Etc.

Represented in the United States by

W. R. ELLIS.

NEW YORK: No. 18 BROADWAY, Room 620. BOSTON: No. 139 MILK STREET.

---



## M. WEILL,

61 & 63 S. Jefferson St., Chicago, Ill.,

Buyer and Seller of Scrap Iron, Steel and Metals and Rubbers.

---

## KEUFFEL & ESSER,

127 FULTON AND 42 ANN STREET, NEW YORK.

MANUFACTURERS AND IMPORTERS OF

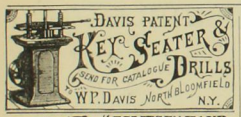
DRAWING MATERIALS

OF THE BEST QUALITY. ALL WARRANTED.

Finest Swiss Drawing Tools, Paragon and Duplex Drawing Papers, Union Tracing-Cloth, Parchment Tracing, Helios Blue Process Paper, Hard Rubber Drawing Tools.

SEND FOR ILLUSTRATED CATALOGUE.

---



"ECLIPSE" HAND PIPE-CUTTING MACHINE.

Simple, Powerful, Portable, Inexpensive. With it one man can easily cut 6-inch Pipe. Made in three sizes.

Address for Prices, &c.

PANCOAST & MAULE,

(Mention this Paper.) Philadelphia, Pa.

---

Fine Coach and Railway Varnishes.

CLARENCE BROOKS & CO.

MANUFACTURERS OF

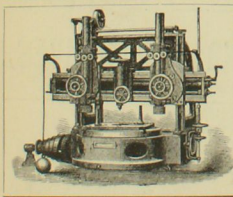
VARNISHES,

Cor. West and West 13th Streets,

NEW YORK.

SEND FOR PRICE LIST.

---



## NILES TOOL WORKS,

Hamilton, Ohio.

MACHINE TOOLS

FOR

Railroad, Locomotive and Car Shops.

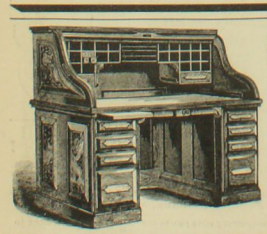
ALL FROM NEW AND IMPROVED PATTERNS

PRICES AND PHOTOGRAPHS ON APPLICATION.

Philadelphia: 22 South Sixth Street.

Chicago: 153 Lake Street.

---



## CUTLER DESK,

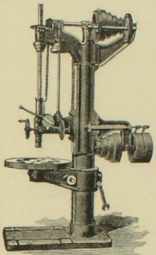
BEST IN THE WORLD.

SEND FOR CATALOGUE

A. CUTLER & SON, BUFFALO, N. Y., U. S. A.

Agencies in LONDON, ENGLAND; PARIS, FRANCE; LILLE, FRANCE.

---



MACHINISTS' TOOLS,

Upright Drills

BORING

AND

Turning Mills

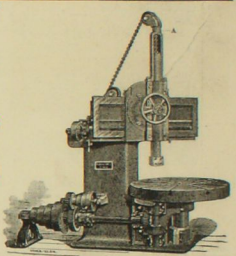
A Specialty.

H. BICKFORD,

Cincinnati, O.,

U. S. A.

Prices and Photographs on Application.



---

## GRIFFIN CAR WHEEL CO.,

DETROIT, MICH.

## GRIFFIN & WELLS FOUNDRY CO.,

CHICAGO, ILL.

## THOMAS F. GRIFFIN & SONS,

BUFFALO, N. Y.,

MANUFACTURERS OF

RAILROAD CAR WHEELS AND CASTINGS.

Annual Capacity, 250,000 Wheels. 15,000 Tons Castings.

---

## PALMER, PARKER & CO.,

## MAHOGANY AND VENEERS,

AND ALL FOREIGN AND DOMESTIC CABINET WOODS.

MILL AND WAREROOMS:

PORTLAND, Cor. TRAVERS ST., BOSTON, MASS.

Send for Price List.

---

## THE FREAS MANUFACTURING CO.,

BERWICK, PA.,

MANUFACTURERS OF

CAR WHEELS, RAILROAD AND MINE CASTINGS,

Machinery and Agricultural Implements.

ESTIMATES FURNISHED ON LIGHT & HEAVY WORK OF EVERY DESCRIPTION

Especial Attention Given to New Inventions, Patented Articles and Specialties.

CORRESPONDENCE SOLICITED.

---

GEORGE F. COCHNOWER, Boston, Mass.

NELSON A. MORKILL, Sherbrook, P. Q.

## GEO. F. COCHNOWER & CO.,

CONTRACTORS AND DEALERS IN

NEW AND OLD RAILWAY EQUIPMENT AND SUPPLIES.

Sole Agents in New England States and British Provinces for the Eames Vacuum Brake.

15 OLIVER STREET, BOSTON, MASS.

P. O. BOX, 2,418.

General Purchasing Agents for Canadian and other Foreign Railways.